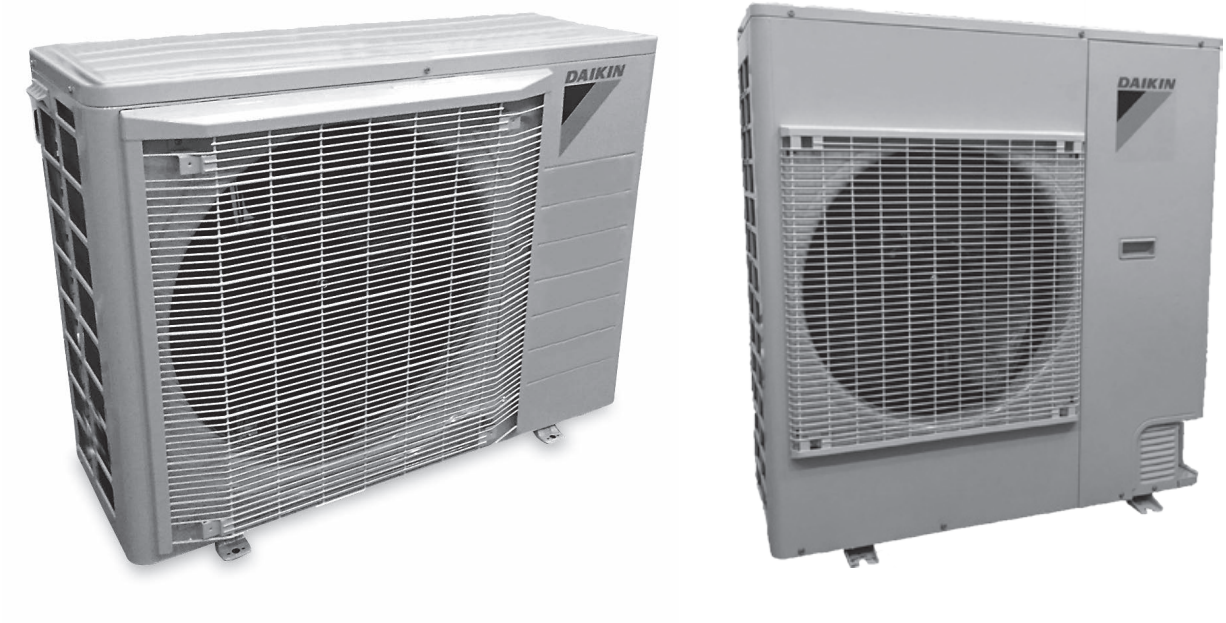
DAIKIN

SiUS611804E

Service Instructions

DX17VSS Inverter Condensing Units
with R-410A Refrigerant
Blowers, Coils, & Accessories



This manual is to be used by qualified, professionally trained HVAC technicians only.
Daikin does not assume any responsibility for property damage or personal injury due to improper service procedures or services performed by an unqualified person.

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IMPORTANT INFORMATION

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IMPORTANT NOTICES FOR CONSUMERS AND SERVICERS

RECOGNIZE SAFETY SYMBOLS, WORDS AND LABELS

⚠ WARNING

HIGH VOLTAGE !

DISCONNECT ALL POWER BEFORE SERVICING. MULTIPLE POWER SOURCES MAY BE PRESENT. FAILURE TO DO SO MAY CAUSE PROPERTY DAMAGE, PERSONAL INJURY OR DEATH.



⚠ WARNING

DO NOT CONNECT TO OR USE ANY DEVICE THAT IS NOT DESIGN CERTIFIED BY THE MANUFACTURER FOR USE WITH THIS UNIT. SERIOUS PROPERTY DAMAGE, PERSONAL INJURY, REDUCED UNIT PERFORMANCE AND/OR HAZARDOUS CONDITIONS MAY RESULT FROM THE USE OF SUCH NON-APPROVED DEVICES.

⚠ WARNING

TO PREVENT THE RISK OF PROPERTY DAMAGE, PERSONAL INJURY, OR DEATH, DO NOT STORE COMBUSTIBLE MATERIALS OR USE GASOLINE OR OTHER FLAMMABLE LIQUIDS OR VAPORS IN THE VICINITY OF THIS APPLIANCE.

⚠ WARNING

ONLY PERSONNEL THAT HAVE BEEN TRAINED TO INSTALL, ADJUST, SERVICE OR REPAIR (HEREINAFTER, "SERVICE") THE EQUIPMENT SPECIFIED IN THIS MANUAL SHOULD SERVICE THE EQUIPMENT. THE MANUFACTURER WILL NOT BE RESPONSIBLE FOR ANY INJURY OR PROPERTY DAMAGE ARISING FROM IMPROPER SERVICE OR SERVICE PROCEDURES. IF YOU SERVICE THIS UNIT, YOU ASSUME RESPONSIBILITY FOR ANY INJURY OR PROPERTY DAMAGE WHICH MAY RESULT. IN ADDITION, IN JURISDICTIONS THAT REQUIRE ONE OR MORE LICENSES TO SERVICE THE EQUIPMENT SPECIFIED IN THIS MANUAL, ONLY LICENSED PERSONNEL SHOULD SERVICE THE EQUIPMENT. IMPROPER INSTALLATION, ADJUSTMENT, SERVICING OR REPAIR OF THE EQUIPMENT SPECIFIED IN THIS MANUAL, OR ATTEMPTING TO INSTALL, ADJUST, SERVICE OR REPAIR THE EQUIPMENT SPECIFIED IN THIS MANUAL WITHOUT PROPER TRAINING MAY RESULT IN PRODUCT DAMAGE, PROPERTY DAMAGE, PERSONAL INJURY OR DEATH.

Pride and workmanship go into every product to provide our customers with quality products. It is possible, however, that during its lifetime a product may require service. Products should be serviced only by a qualified service technician who is familiar with the safety procedures required in the repair and who is equipped with the proper tools, parts, testing instruments and the appropriate service manual. **REVIEW ALL SERVICE INFORMATION IN THE APPROPRIATE SERVICE MANUAL BEFORE BEGINNING REPAIRS.**

To locate an authorized servicer, please consult your telephone book or the dealer from whom you purchased this product. For further assistance, please contact:

CONSUMER INFORMATION LINE - DAIKIN BRAND PRODUCTS
TOLL FREE 1-855-770-5678 (U.S. only)
email us at: **customerservice@daikincomfort.com**
fax us at: **(713) 856-1821**
(Not a technical assistance line for dealers.)

Outside the U.S., call 1-713-861-2500.
(Not a technical assistance line for dealers.)
our telephone company will bill you for the call.

SAFE REFRIGERANT HANDLING

While these items will not cover every conceivable situation, they should serve as a useful guide.

⚠ WARNING

REFRIGERANTS ARE HEAVIER THAN AIR. THEY CAN "PUSH OUT" THE OXYGEN IN YOUR LUNGS OR IN ANY ENCLOSED SPACE. TO AVOID POSSIBLE DIFFICULTY IN BREATHING OR DEATH:

- **NEVER PURGE REFRIGERANT INTO AN ENCLOSED ROOM OR SPACE. BY LAW, ALL REFRIGERANTS MUST BE RECLAIMED.**
- **IF AN INDOOR LEAK IS SUSPECTED, THOROUGHLY VENTILATE THE AREA BEFORE BEGINNING WORK.**
- **LIQUID REFRIGERANT CAN BE VERY COLD. TO AVOID POSSIBLE FROST BITE OR BLINDNESS, AVOID CONTACT AND WEAR GLOVES AND GOGGLES. IF LIQUID REFRIGERANT DOES CONTACT YOUR SKIN OR EYES, SEEK MEDICAL HELP IMMEDIATELY.**
- **ALWAYS FOLLOW EPA REGULATIONS. NEVER BURN REFRIGERANT, AS POISONOUS GAS WILL BE PRODUCED.**

IMPORTANT INFORMATION

⚠ WARNING

THE UNITED STATES ENVIRONMENTAL PROTECTION AGENCY ("EPA") HAS ISSUED VARIOUS REGULATIONS REGARDING THE INTRODUCTION AND DISPOSAL OF REFRIGERANTS INTRODUCED INTO THIS UNIT. FAILURE TO FOLLOW THESE REGULATIONS MAY HARM THE ENVIRONMENT AND CAN LEAD TO THE IMPOSITION OF SUBSTANTIAL FINES. THESE REGULATIONS MAY VARY BY JURISDICTION. SHOULD QUESTIONS ARISE, CONTACT YOUR LOCAL EPA OFFICE.

⚠ WARNING

TO AVOID POSSIBLE EXPLOSION:

- NEVER APPLY FLAME OR STEAM TO A REFRIGERANT CYLINDER. IF YOU MUST HEAT A CYLINDER FOR FASTER CHARGING, PARTIALLY IMMERSE IT IN WARM WATER.
- NEVER FILL A CYLINDER MORE THAN 80% FULL OF LIQUID REFRIGERANT.
- NEVER ADD ANYTHING OTHER THAN R-410A TO A RETURNABLE R-410A CYLINDER. THE SERVICE EQUIPMENT USED MUST BE LISTED OR CERTIFIED FOR THE TYPE OF REFRIGERANT USE.
- STORE CYLINDERS IN A COOL, DRY PLACE. NEVER USE A CYLINDER AS A PLATFORM OR A ROLLER.

⚠ WARNING

TO AVOID POSSIBLE EXPLOSION:

- USE ONLY RETURNABLE (NOT DISPOSABLE) SERVICE CYLINDERS WHEN REMOVING REFRIGERANT FROM A SYSTEM.
- ENSURE THE CYLINDER IS FREE OF DAMAGE WHICH COULD LEAD TO A LEAK OR EXPLOSION.
- ENSURE THE HYDROSTATIC TEST DATE DOES NOT EXCEED 5 YEARS.
- ENSURE THE PRESSURE RATING MEETS OR EXCEEDS 400 LBS.

WHEN IN DOUBT, DO NOT USE THE CYLINDER.

⚠ WARNING

TO AVOID POSSIBLE INJURY, EXPLOSION OR DEATH, PRACTICE SAFE HANDLING OF REFRIGERANTS.

⚠ CAUTION

THE COMPRESSOR PVE OIL FOR R-410A UNITS IS EXTREMELY SUSCEPTIBLE TO MOISTURE ABSORPTION AND COULD CAUSE COMPRESSOR FAILURE. DO NOT LEAVE SYSTEM OPEN TO ATMOSPHERE ANY LONGER THAN NECESSARY FOR INSTALLATION.

NOTICE

INVERTER A/C MODELS CAN ONLY BE MATCHED WITH A CAPEA** AND CHPE** A-COIL. DAMAGE RESULTING FROM OPERATION WITH ANY OTHER COMBINATION IS NOT COVERED BY OUR WARRANTIES.

⚠ WARNING

SYSTEM CONTAMINANTS, IMPROPER SERVICE PROCEDURE AND/OR PHYSICAL ABUSE AFFECTING HERMETIC COMPRESSOR ELECTRICAL TERMINALS MAY CAUSE DANGEROUS SYSTEM VENTING.

NOTICE: When the outdoor unit is connected to main power, the inverter board has a small current flowing into it to be prepared for operation when needed. Due to this, the PCB components have to be cooled even when the unit is not running. For this cooling operation, the condenser fan may come on at any time, including in the winter months. Any obstruction to the outdoor fan should be avoided at all times when the unit is powered to prevent damage.

The successful development of hermetically sealed refrigeration compressors has completely sealed the compressor's moving parts and electric motor inside a common housing, minimizing refrigerant leaks and the hazards sometimes associated with moving belts, pulleys or couplings.

Fundamental to the design of hermetic compressors is a method whereby electrical current is transmitted to the compressor motor through terminal conductors which pass through the compressor housing wall. These terminals are sealed in a dielectric material which insulates them from the housing and maintains the pressure tight integrity of the hermetic compressor. The terminals and their dielectric embedment are strongly constructed, but are vulnerable to careless compressor installation or maintenance procedures and equally vulnerable to internal electrical short circuits caused by excessive system contaminants.

In either of these instances, an electrical short between the terminal and the compressor housing may result in the loss of integrity between the terminal and its dielectric embedment. This loss may cause the terminals to be expelled, thereby venting the vaporous and liquid contents of the compressor housing and system.

A venting compressor terminal normally presents no danger to anyone, providing the terminal protective cover is properly in place.
If, however, the terminal protective cover is not properly in place, a venting terminal may discharge a combination of

(a) hot lubricating oil and refrigerant
(b) flammable mixture (if system is contaminated with air)

in a stream of spray which may be dangerous to anyone in the vicinity. Death or serious bodily injury could occur.

Under no circumstances is a hermetic compressor to be electrically energized and/or operated without having the terminal protective cover properly in place.
See Service Section S-17 for proper servicing.

PRODUCT IDENTIFICATION

NOMENCLATURE FOR OUTDOOR UNIT

D	X	17	V	S	S	18	1	A	A

Brand
D - Daikin

Type
X - AC R-410A
Z - HP R-410A

SEER
17 - 17 SEER
18 - 18 SEER
20 - 20 SEER

Compressor
V - Variable Speed
S - Single
T - Two Stage

Feature Set
S - Side Discharge Communicating
A - Base
C - Comfortnet
D - Deluxe
N - Nominal

Region
N - North
S - Southeast & North
A - All

Tonnage Nominal
18 - 1.5 ton
24 - 2.0 ton
30 - 2.5 ton
36 - 3.0 ton
42 - 3.5 ton
48 - 4.0 ton
60 - 5.0 ton

Voltage
1 - 208/230 V single phase 60 Hz
2 - 208/240 V single phase 50 Hz

Engineering
Major Revision

Engineering
Minor Revision

** NOTE: Not all feature sets / compressors available at initial launch of product

PRODUCT IDENTIFICATION

NOMENCLATURES FOR INDOOR UNIT (CASED COIL)

C	A	P	E	A	18	18	B	4	AA

Product Category
C - Indoor Coil

Application
A - Upflow/Downflow
H - Horizontal A Coil
S - Horizontal Slab Coil

Cabinet Finish
U - Uncased
P - Painted
C - Unpainted

Expansion Device
F - Flowrator
T - TXV
E - Electronic expansion valve

Coil Configuration
A - A Coil
S - Slab

Tonnage Nominal
18 - 1.5 to 2.0 ton
24 - 2.0 to 2.5 ton
30 - 3.0 ton

Height
18 - 18" Coil
22 - 22" Coil
26 - 26" Coil

Nominal Width for Gas Furnace
A - Fits 14" Furnace Cabinet
B - Fits 17½" Furnace Cabinet
C - Fits 21" Furnace Cabinet
D - Fits 24½" Furnace Cabinet
N - Does Not Apply (horizontal slab coil)

Refrigerant
6 - R-22 / R-410A
2 - R-22
4 - R-410A

Engineering
Major/Minor Revisions

C	H	P	E	2430	B	4	AA

Product Category
C - Indoor Coil

Application
A - Upflow/Downflow Coil
H - Horizontal A Coil
S - Horizontal Slab Coil

Cabinet Finish
U - Uncased
P - Painted
C - Unpainted

Expansion Device
F - Flowrator
T - TXV
E - Electronic expansion valve

Tonnage Nominal
<CAPE>
4860 - 3.5 to 4.0 ton
4961 - 4.0 to 5.0 ton
<CHPE>
2430 - 1.5 ton
3636 - 2.0 to 2.5 ton
3642 - 2.0 to 2.5 ton
3743 - 3.0 to 3.5 ton
4860 - 3.5 to 5.0 ton

Nominal Width for Gas Furnace
A - Fits 14” Furnace Cabinet
B - Fits 17½” Furnace Cabinet
C - Fits 21” Furnace Cabinet
D - Fits 24½” Furnace Cabinet
N - Does Not Apply (horizontal slab coil)

Refrigerant
6 - R-22 / R-410A
2 - R-22
4 - R-410A

Engineering
Major/Minor Revisions

ACCESSORIES FOR INDOOR UNIT

CASED COIL (CAPE(A)*, CHPE*)

Please refer to the latest spec sheet of CAPE(A)* or CHPE*.

MODULAR BLOWER (MBVC*)

Please refer to the latest spec sheet and service manual of Modular Blower about an Electric Heater Kit and other Accessories.

GAS FURNACES (D*97MC*, D*96VC, D*80VC*)

Please refer to the latest spec sheet and service manual of Gas Furnaces.

NOTICE

THIS MANUAL MAINLY DESCRIBES THE SERVICE CONTENTS OF OUTDOOR UNIT AND CASED COIL (CAPE(A)*/CHPE*).
FOR INFORMATION ON GAS FURNACE AND MODULAR BLOWER, PLEASE REFER TO A SERVICE MANUAL OF EACH MODEL.

TESTING CAPACITOR RESISTANCE

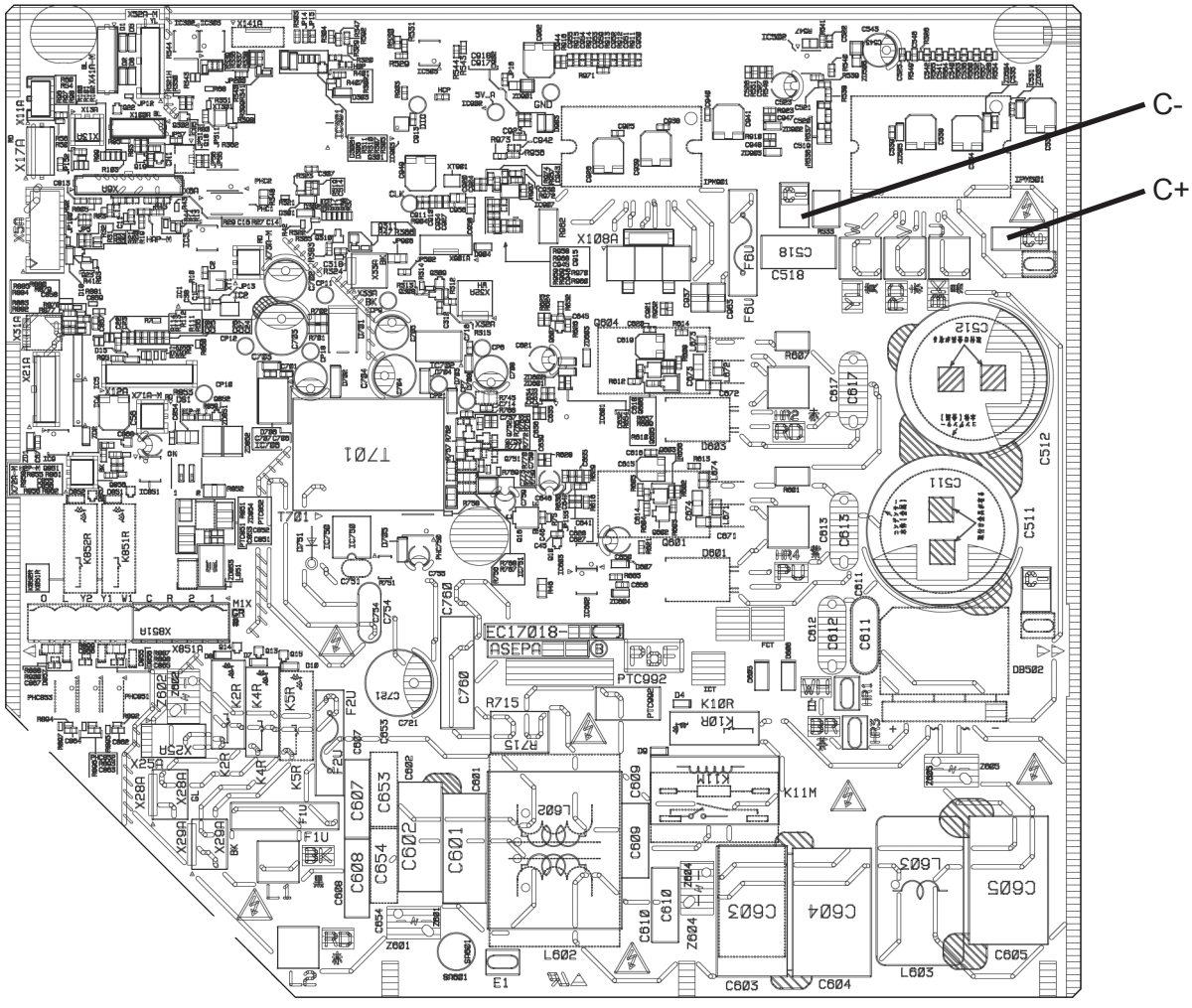
WARNING

Avoid contact with the charged area.

•Never touch the charged area before confirming that the residual voltage is 50 volts or less.

1. **Shut down the power and leave the control box for 10 minutes.**
2. **Make sure to touch the Earth ground terminal to release the static electricity from your body (to prevent failure of the PC board).**
3. **Measure the residual voltage in the specified measurement position using a VOM while paying attention not to touch the charged area.**
4. **Immediately after measuring the residual voltage, disconnect the connectors of the outdoor unit's fan motor. (If the fan blade rotates by strong wind blowing against it, the capacitor will be charged, causing the danger of electrical shock.)**

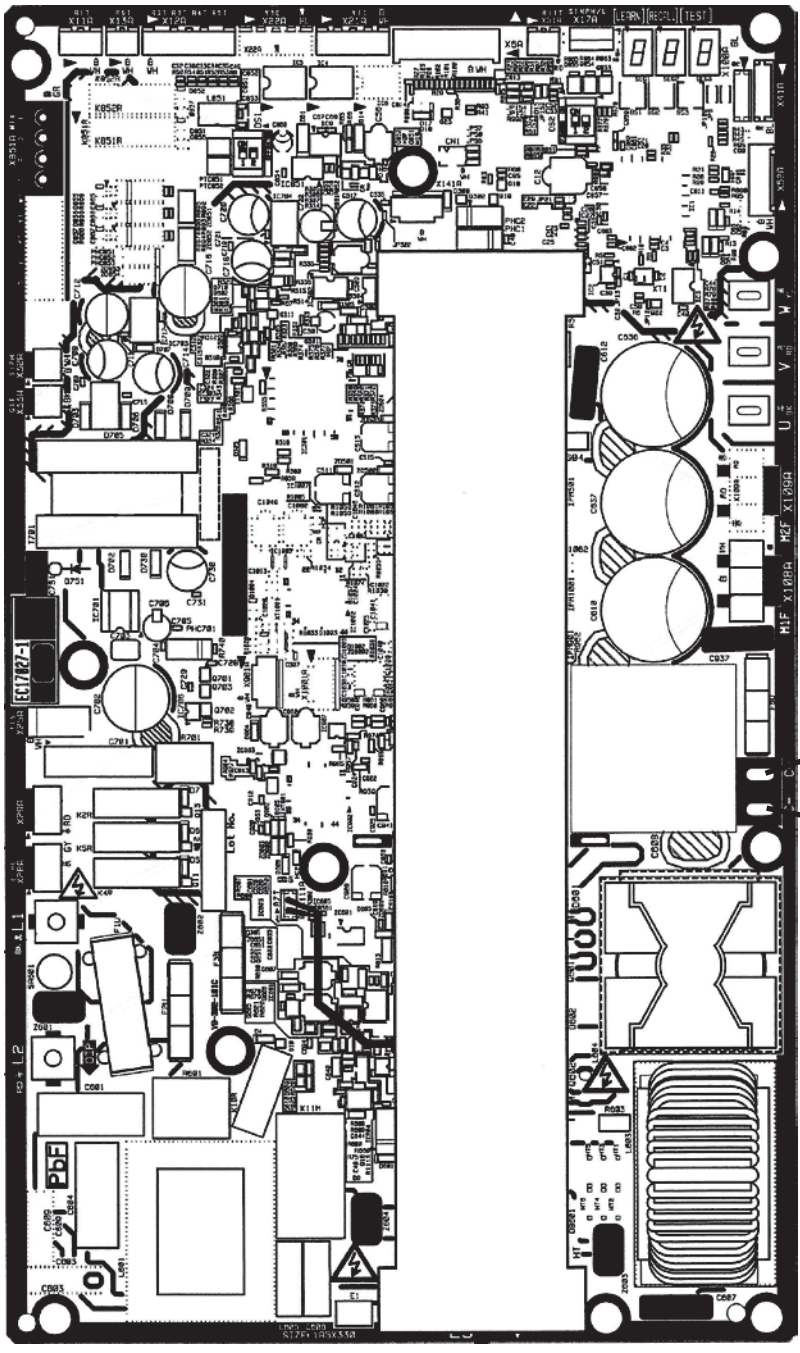
DX17VSS181/241/301/361AA



Capacitor Voltage

TESTING CAPACITOR RESISTANCE

DX17VSS421/481/601AA



Capacitor Voltage

SYSTEM OPERATION

This section gives a basic description of cooling unit operation, its various components and their basic operation. Ensure your system is properly sized for heat gain and loss according to methods of the Air Conditioning Contractors Association (ACCA) or equivalent.

CONDENSING UNIT

The condenser air is pulled through the condenser coil by a direct drive propeller fan. This condenser air is discharged to the side of the cabinet. These units are designed for free air discharge, so no additional resistance, like duct work, shall be attached.

The suction and liquid line connections are brazing type for field piping with refrigerant type copper. Front seating valves are factory installed to accept the field run copper. The total refrigerant charge for a normal installation is factory installed in the condensing unit.

DX17VSS models are available in 1.5 through 5.0 ton sizes and use R-410A refrigerant. They are designed for 208/230 volt single phase applications.

DX17VSS R-410A model units use a Daikin rotary compressor. These models are ComfortNet™ ready.

There are a number of design characteristics which are different from the traditional reciprocating and/or scroll compressors.

DX17VSS models use "FVC50K" which is **NOT** compatible with mineral oil based lubricants like 3GS. "FVC" oil (required by the manufacturer) must be used if additional oil is required.

COOLING

The refrigerant used in the system is R-410A. It is a clear, colorless, non-toxic and non-irritating liquid. R-410A is a 50:50 blend of R-32 and R-125. The boiling point at atmospheric pressure is -**62.9°F.**

A few of the important principles that make the refrigeration cycle possible are: heat always flows from a warmer to a cooler body. Under lower pressure, a refrigerant will absorb heat and vaporize at a low temperature. The vapors may be drawn off and condensed at a higher pressure and temperature to be used again.

The indoor evaporator coil functions to cool and dehumidify the air conditioned spaces through the evaporative process taking place within the coil tubes.

NOTE: The pressures and temperatures shown in the refrigerant cycle illustrations on the following pages are for demonstration purposes only. Actual temperatures and pressures are to be obtained from the "Expanded Performance Chart".

Liquid refrigerant at condensing pressure and temperatures leaves the outdoor condensing coil through the drier and is metered into the indoor coil through the metering device. As the cool, low pressure, saturated refrigerant enters the tubes of the indoor coil, a portion of the liquid immediately vaporizes. It continues to soak up heat and vaporizes as it proceeds through the coil, cooling the indoor coil down to about 48°F.

Heat is continually being transferred to the cool fins and tubes of the indoor evaporator coil by the warm system air. This warming process causes the refrigerant to boil. The heat removed from the air is carried off by the vapor.

As the vapor passes through the last tubes of the coil, it becomes superheated. That is, it absorbs more heat than is necessary to vaporize it. This is assurance that only dry gas will reach the compressor. Liquid reaching the compressor can weaken or break compressor valves.

The compressor increases the pressure of the gas, thus adding more heat, and discharges hot, high pressure superheated gas into the outdoor condenser coil.

In the condenser coil, the hot refrigerant gas, being warmer than the outdoor air, first loses its superheat by heat transferred from the gas through the tubes and fins of the coil. The refrigerant now becomes saturated, part liquid, part vapor and then continues to give up heat until it condenses to a liquid alone. Once the vapor is fully liquefied, it continues to give up heat which subcools the liquid, and it is ready to repeat the cycle.

The inverter system can stop the compressor or outdoor fan to protect the unit. The inverter system can run higher compressor speed than required from thermostat to recover compressor oil that flows.

IMPORTANT

To avoid overheating the service valve, EEV, or filter drier while brazing, wrap the component with a wet rag, or use a thermal heat trap compound. Be sure to follow the manufacturer's instruction when using the heat trap compound. Note: Remove Schrader valves from service valves before brazing tubes to the valves. Use a brazing alloy of 2% minimum silver content. Do not use flux.

Torch heat required to braze tubes of various sizes is proportional to the size of the tube. Tubes of smaller size require less heat to bring the tube to brazing temperature before adding brazing alloy. Applying too much heat to any tube can melt the tube. Service personnel must use the appropriate heat level for the size of the tube being brazed.

SYSTEM OPERATION

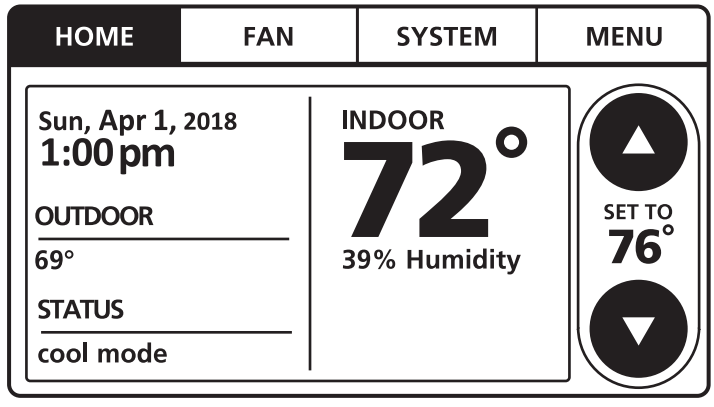
NOTE: In this service manual, the setting method using CTK04AE is shown. When using other DAIKIN approved thermostat, refer to the service manual of each thermostat.

BOOST MODE

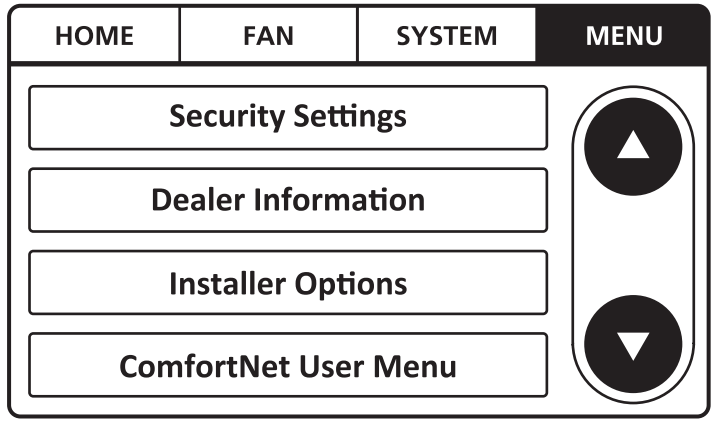
BOOST MODE enables the system to operate at increased compressor speeds to satisfy unusual high loads. BOOST MODE is initiated by an outdoor temperature sensor located in the air conditioner. Please note that outdoor equipment operational sound levels may increase while the equipment is running in BOOST MODE since compressor speed higher than normal operation is allowed.

NOTE: BOOST MODE is ON by default and is activated when the outdoor temperature reaches 100°F. BOOST MODE can be disabled and enabled and the activation temperature adjusted in “BOOST TEMP” menu using the following procedure:

1. On the “HOME” screen, select “MENU”.

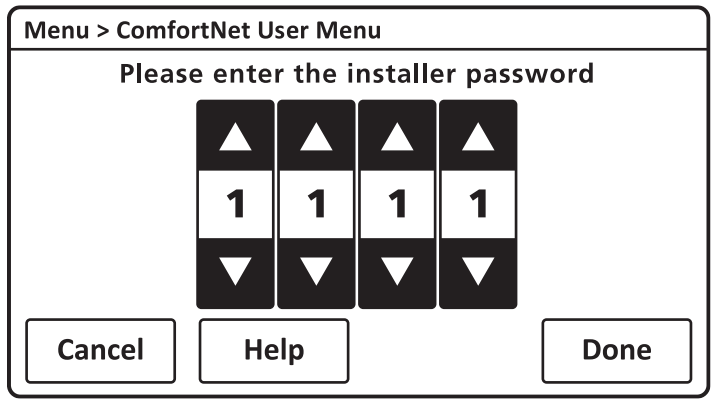


2. From the “MENU” screen, scroll down and select “ComfortNet User Menu”.

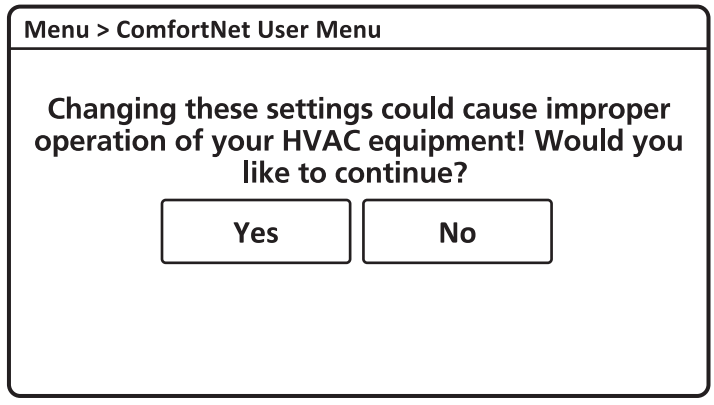


SYSTEM OPERATION

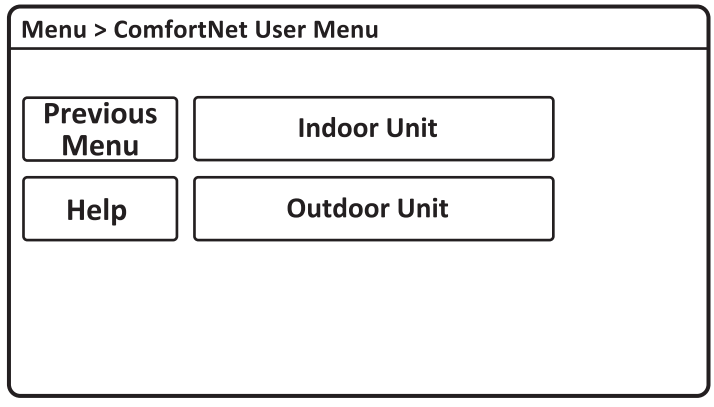
3. Enter Installer password. (The password is the Date Code located on the thermostat and is available by entering the “EQUIPMENT STATUS” menu and scrolling to the bottom).



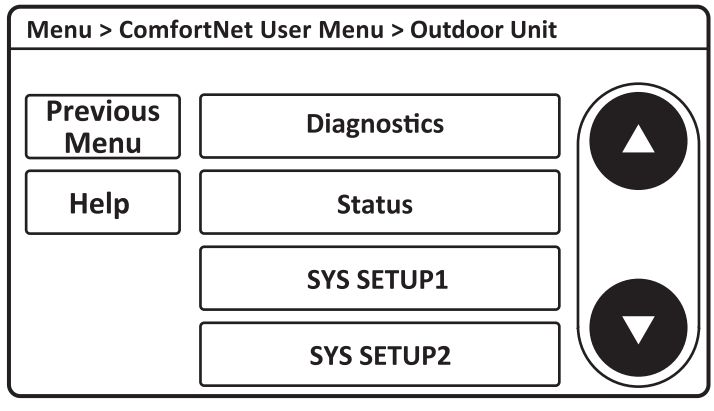
4. Confirm message, then select “YES” to continue.



5. From the “ComfortNet User Menu”, select “Outdoor Unit”.

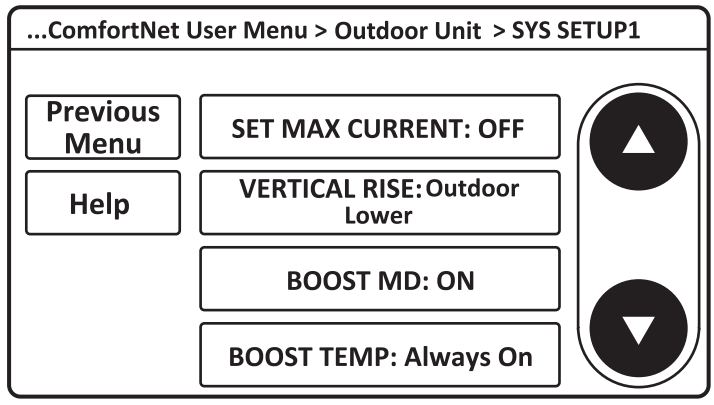


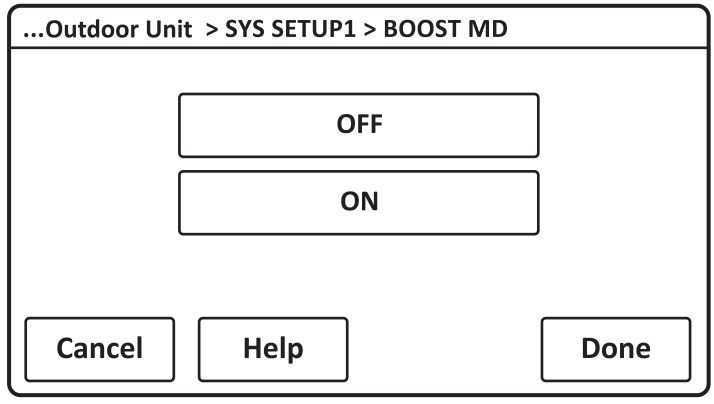
6. From the “Outdoor Unit”, scroll down and select “SYS SETUP1”.



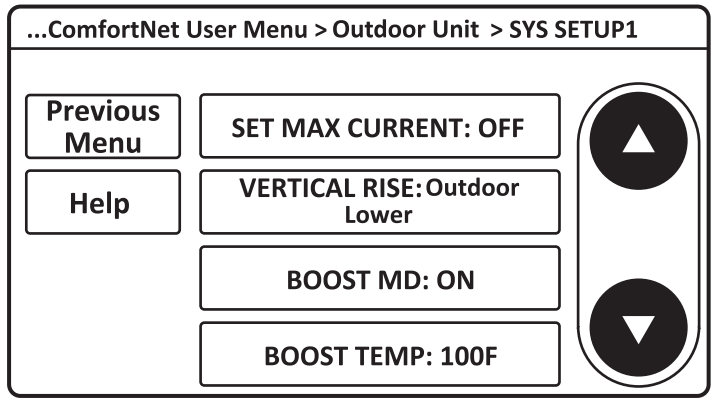
SYSTEM OPERATION

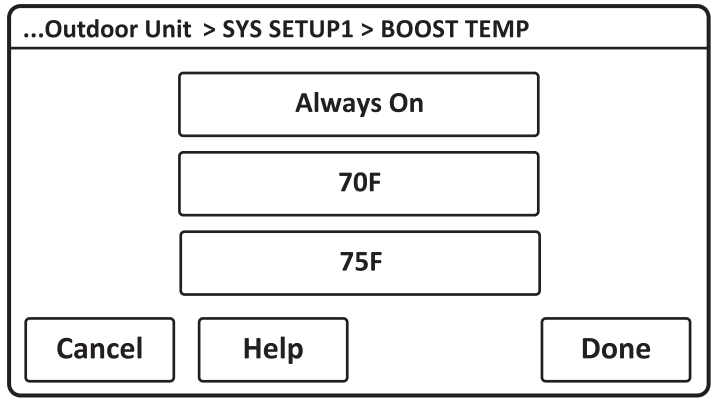
7. “BOOST MD” turns BOOST MODE OFF or ON. BOOST MODE is on by default.



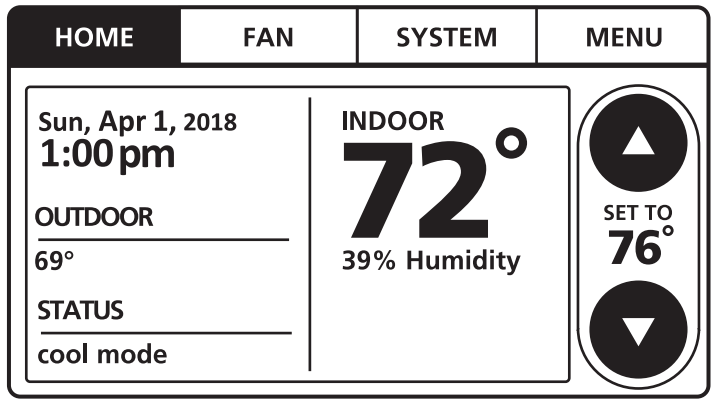


8. “BOOST TEMP” adjusts the activation temperature from 70° F to 105° F. “Always ON” option is also available to permanently engage BOOST MODE. Factory default is 100° F.





9. Once satisfied with BOOST MODE adjustments, navigate to the “HOME” screen by selecting the Previous Menu button three times then selecting “HOME”.



DEHUMIDIFICATION (In Case of CTK04)

The thermostat reads the indoor humidity level from the CTK04 and allows the user to set a dehumidification target based on these settings. The thermostat controls the humidity level of the conditioned space using the cooling system. Dehumidification is engaged whenever a cooling demand is present and structural humidity levels are above the target level. When this condition exists the circulating fan output is reduced, increasing system run time, over cooling the evaporator coil and ultimately removing more humidity from the structure than if only in cooling mode. The CTK04 also allows for an additional overcooling limit setting from 0 °F to 3 °F setup through the Installer Option menu (direction below). This allows the cooling system to further reduce humidity by lowering the temperature up to 3° F below the cooling setpoint in an attempt to better achieve desired humidity levels.

By default, dehumidification needs to be turned ON at the thermostat via the Dehumidification Equipment menu. Dehumidification can be activated at the original equipment setup by selecting the A/C with “Low Speed Fan” button in the “Dehumidification” Menu. Availability can be verified by pressing “MENU” on the home screen. Scroll down and if a Dehumidification button is present dehumidification is activated.

If Dehumidification is not available in the menu then it must be enabled through the “Installer Options” menu. Use the following procedure to enable and disable dehumidification:

1. On the CTK04 HOME screen, select “MENU”.
2. From the “MENU” screen, scroll down and select “Installer Options”.
3. Enter installer password if known.
   a. The password is the thermostat date code and can be obtained by selecting the red “Cancel” button and selecting the “Dealer Information” button.
   b. Once recorded, click the green “Done” button and return to the previous step.
4. Select “YES” to continue.
5. Select “View / Edit Current Setup”.
6. Scroll down and select “Dehumidification”.
7. Once open, select “Dehumidification Equipment: None”.
8. From the Dehumidification Menu select “A/C with Low Speed Fan” and click the green “Done” button.
9. Additional Dehumidification operational options can be selected in the resulting window.
10. Once satisfied with the selection navigate to the “HOME” screen by selecting the “Done” button and selecting “Yes” to verify the changes.
11. Select “Previous Menu”, then “HOME” to return to the main menu.

DEHUMIDIFICATION TIPS

For effective dehumidification operation:

- Ensure “Dehum” is ON through the Installer Options menu and/or in the ComfortNet User Menu (COOL SETUP).
  - If ON, the Dehumidification menu should be visible in the main menu.
- Verify the cooling airflow profile is set to “Profile D”.
  - See the Indoor Airflow section on page 34 for complete airflow profile setting.
  - By default “Dehum” is ON and the cooling airflow profile is set to “Profile D”.
- For additional dehumidification control, airflow settings are field adjustable and can be fine-tuned to a value that is comfortable for the application from a range of +15% to -15%.
  - See the Air Conditioner Advanced Feature Menu section on page 61 for more detail.

SYSTEM OPERATION

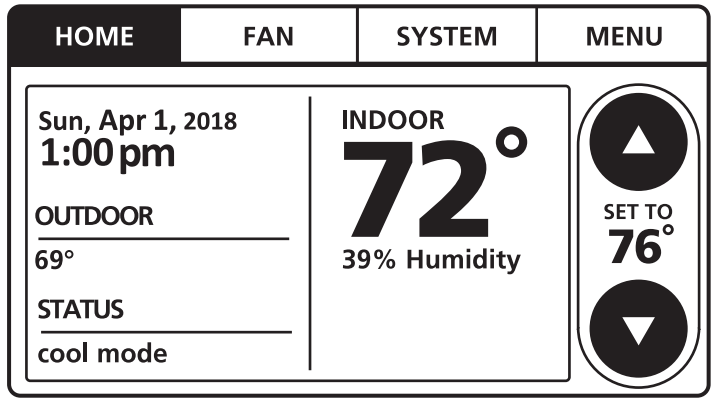
Night Mode (In Case of CTK04)

FIELD SELECTABLE NIGHT MODE

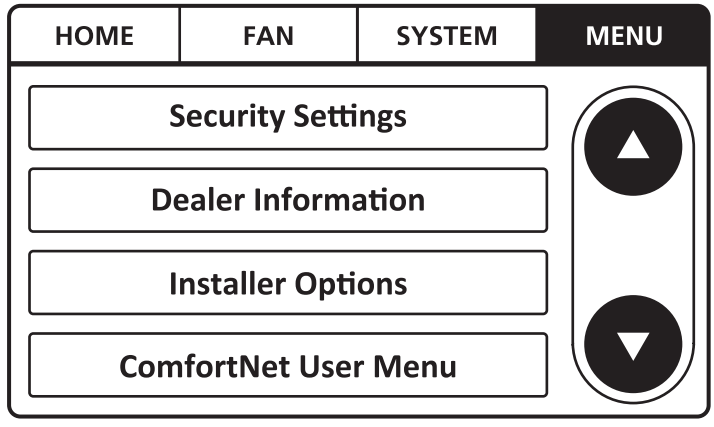
NIGHT MODE enables the system to operate at decreased compressor and fan speeds to satisfy quiet driving at night time.

NIGHT MODE is initiated by user's setting ("ON" or "OFF". Default is "OFF").

1. On the "HOME" screen, select "MENU".

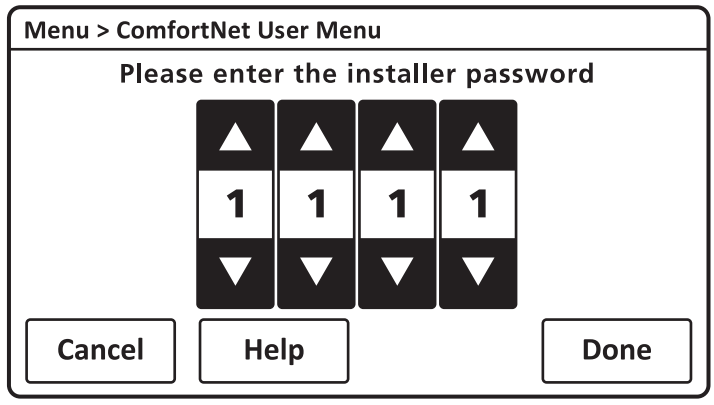


2. From the "MENU" screen, scroll down and select "ComfortNet User Menu".

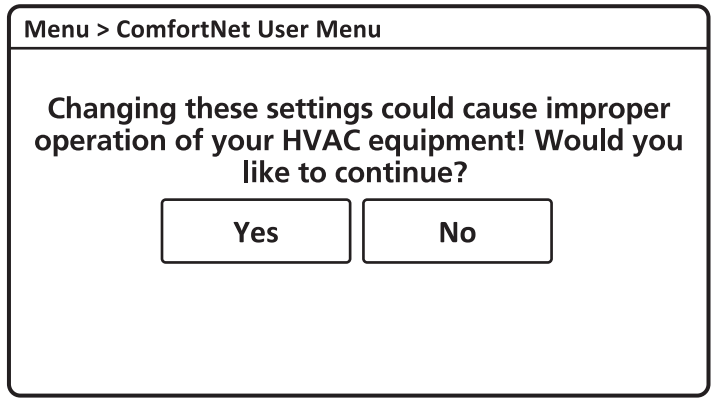


SYSTEM OPERATION

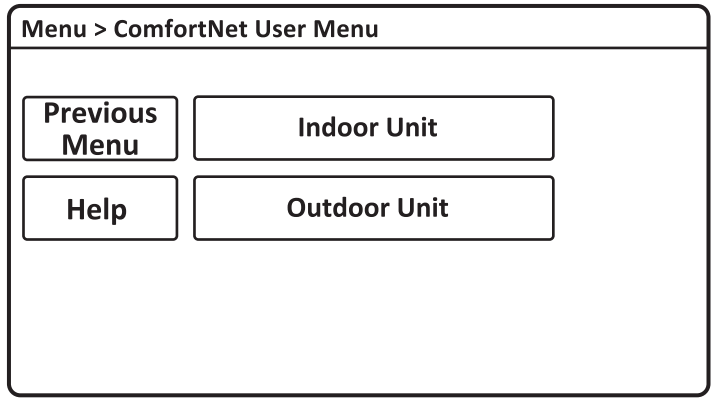
3. Enter Installer password. (The password is the Date Code located on the thermostat and is available by entering the “EQUIPMENT STATUS” menu and scrolling to the bottom).



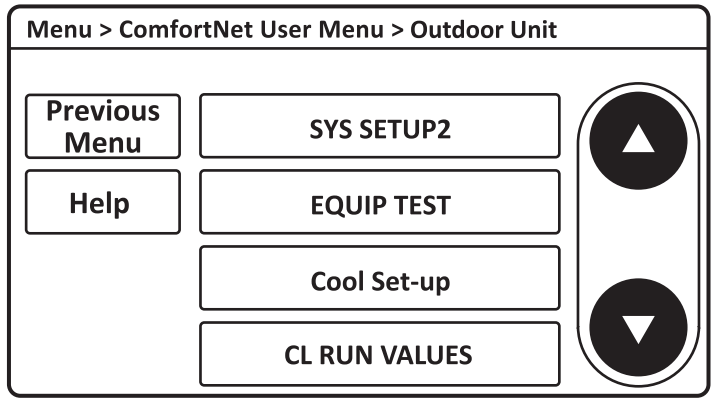
4. Confirm message, then select “YES” to continue.



5. From the “ComfortNet User Menu”, select “Outdoor Unit”.

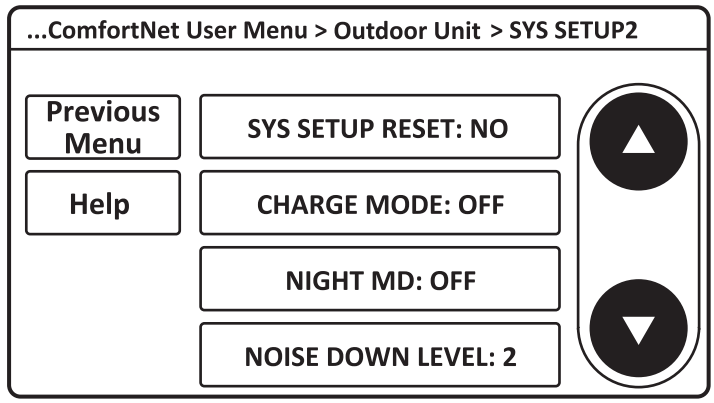


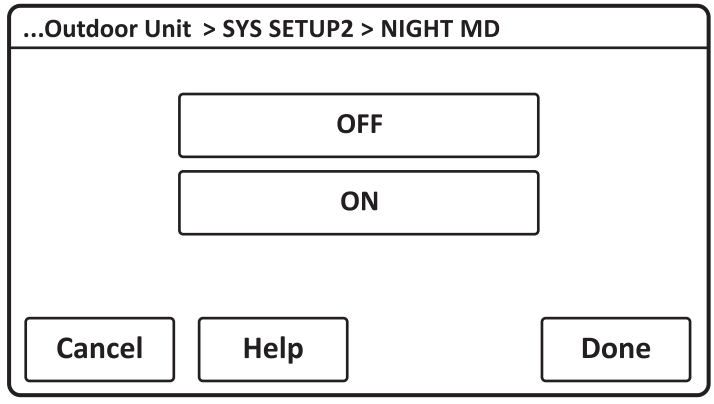
6. From the “Outdoor Unit”, scroll down and select “SYS SETUP2”.



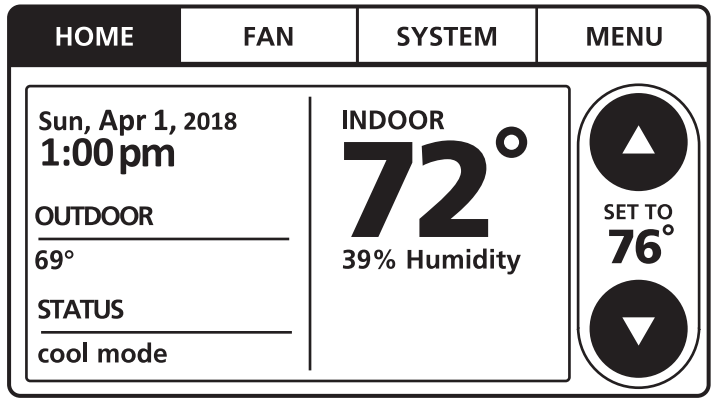
SYSTEM OPERATION

7. “NIGHT MD” turns NIGHT MODE “ON” or “OFF”. NIGHT MODE is “OFF” by default.





8. Once satisfied with NIGHT MODE adjustments, navigate to the “HOME” screen by selecting the “Previous Menu” button three times then selecting “HOME”.



NOTE:
“NOISE DOWN LEVEL” is initiated by user’s setting.

(“LEVEL” “1”, “2” or “3”. Default is “LEVEL” “2”. “LEVEL” “3” is the most quiet.)

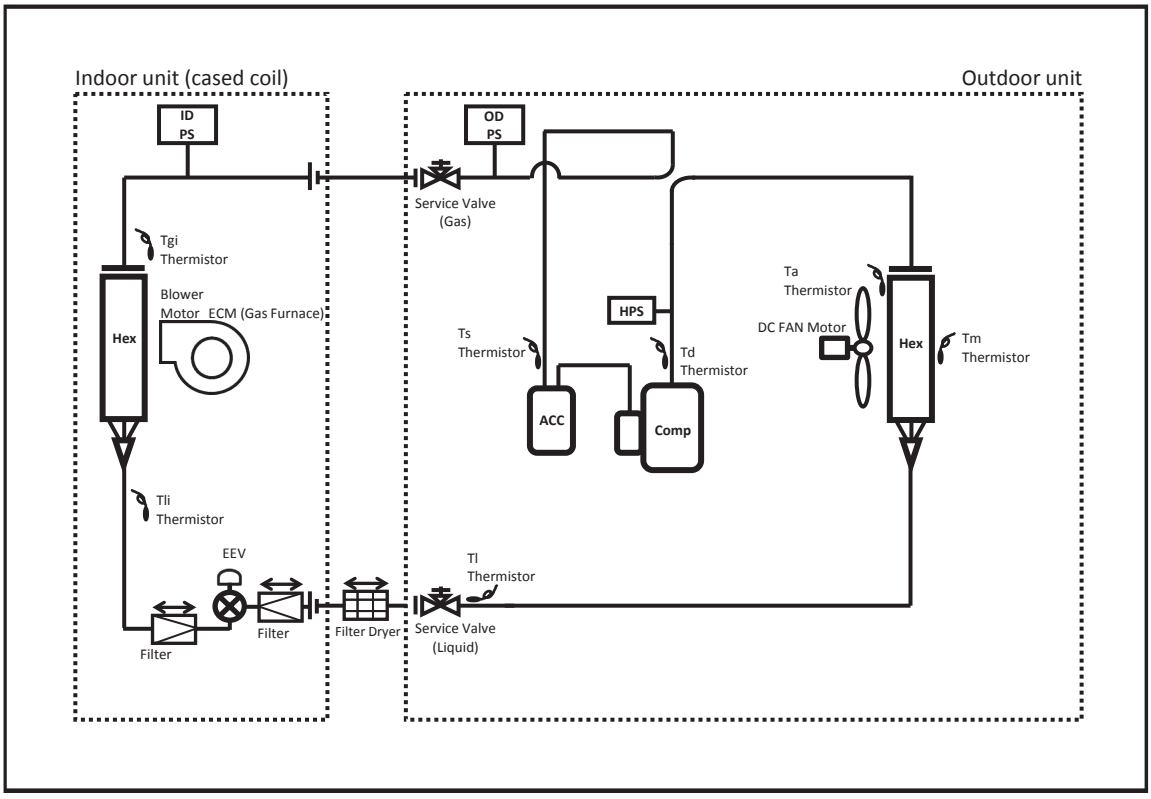
NIGHT MODE start time can be adjusted up to +4 hours per hour from default setting. Also end time can be adjusted up to -4 hours per hour from default setting. Default time is determined by air conditioner inner clock and logic. Adjustment of start/end may be needed for some region and time zone.

If during operation the capacity demand is high, then the night mode function will be temporary off by capacity priority function to return the room temperature to the set point. (Default is ON)

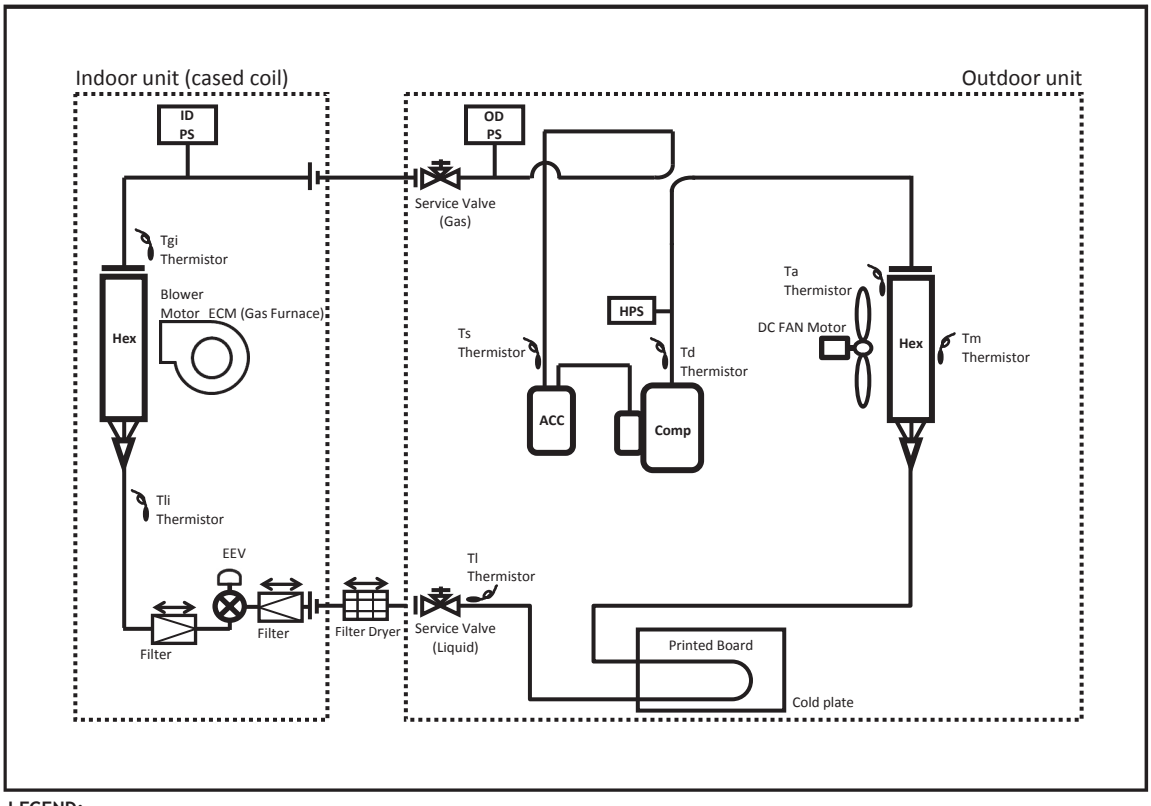
SYSTEM OPERATION

COOLING CYCLE

DX17VSS181/241/301/361AA



DX17VSS421/481/601AA

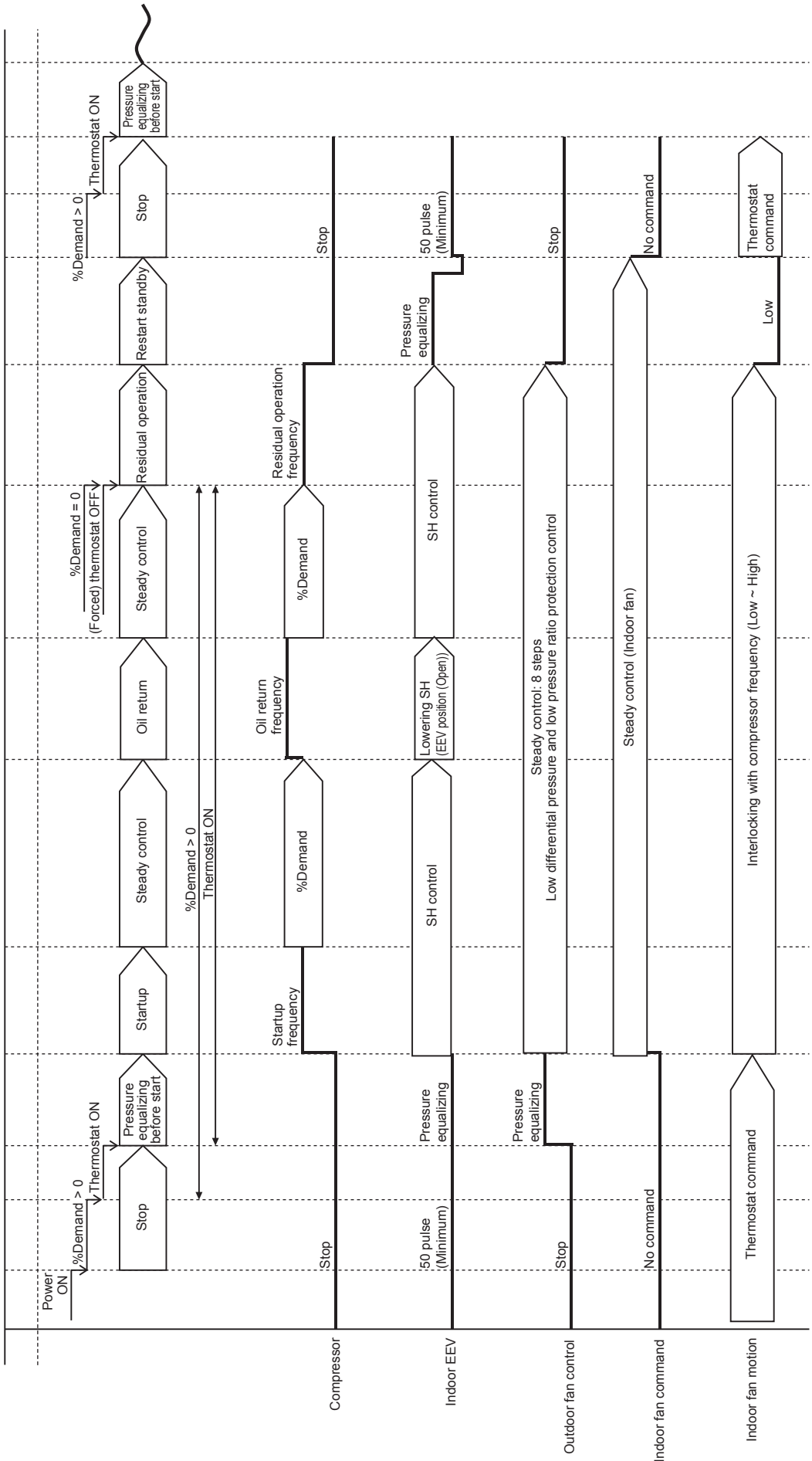


LEGEND:

Tl = Thermistor (Outdoor Liquid Temperature)
Td = Thermistor (Discharge Temperature)
Ta = Thermistor (Outdoor Air Temperature)
Tm = Thermistor (Outdoor Coil Temperature)
Ts = Thermistor (Suction Temperature)
Tli = Thermistor (Indoor Liquid Temperature)
Tgi = Thermistor (Indoor Gas Temperature)
ID PS = Indoor Pressure Sensor
OD PS = Outdoor Pressure Sensor
HPS = High Pressure Switch

SYSTEM OPERATION

COOLING OPERATION FLOW



POSSIBLE CAUSE X IN ANALYSIS GUIDE INDICATE "POSSIBLE CAUSE"	Comp discharge temp > 200F	Comp discharge temp < 105F	Comp discharge SH > 70F	Comp discharge SH < 20F	High pressure > 490psi	High pressure < 255psi	LSV SC > 12F	LSV SC < 4F	OD SSV SH > 20F	OD SSV SH < 4F	Low pressure > 185psi	Low pressure < 100psi	Requested % demand < Actual	Requested % demand > Actual	Repeated stop/start	Weak cooling	No switch cooling	Noise	Stop operation	Test Method Remedy
Liquid stop valve does not fully open	X		X		X		X		X			X		X	X	X		X		Fully open Liquid stop valve
Suction stop valve does not fully open	X		X									X		X	X	X				Fully open Suction stop valve
Line set restriction	X		X		X		X		X			X		X	X	X		X		Check Line set
Line set length is too long									X			X			X	X		X		Check Line set length; Change OD position if needed
Blocked filter-dryer	X		X		X		X		X			X		X	X	X		X		Replace filter-dryer
ID EEV coil failure	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X			X	Check the connection to control board; Repair/replace if needed
ID EEV failure	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X				Check ID EEV; Replace/repair if needed
High Pressure switch failure																			X	Check resistance to verify operation; Replace if needed
Pressure sensor failure	X										X	X		X	X	X			X	Check resistance and connections to verify operation; Replace if needed
Suction temp sensor failure													X	X		X				Check resistance and connections to verify operation; Replace if needed
Discharge temp sensor failure	X	X	X	X									X	X	X	X			X	Check resistance and connections to verify operation; Replace if needed
Coil temp sensor failure				X	X	X							X	X	X	X			X	Check resistance and connections to verify operation; Replace if needed
Liquid temp sensor failure																				Check resistance and connections to verify operation; Replace if needed
Ambient temp sensor failure				X	X	X							X	X	X	X				Check resistance and connections to verify operation; Replace if needed
OD recirculation	X		X		X									X	X	X		X		Re-arrange OD position
ID recirculation		X		X						X		X	X	X	X	X				Re-arrange ID position
Dirty OD Heat-exchanger	X		X		X									X	X	X		X		Check OD Heat-exchanger; Clean
Dirty ID Heat-exchanger		X		X				X		X		X	X	X	X	X				Check ID Heat-exchanger; Clean
Outdoor Ambient temp is too high	X		X		X					X				X	X	X		X		-
Outdoor Ambient temp is too low		X		X		X	X					X	X	X	X	X				-
ID suction temp is too high									X		X									Check ID EEV; Repair/replace if needed
ID suction temp is too low		X		X				X		X		X	X	X	X	X				Check ID Heat-exchanger; Repair/replace if needed
Mixture of non-condensible gas	X		X		X			X	X			X		X	X	X		X		Recover Refrigerant, evacuate pipe, and re-charge
OD fan motor failure	X		X		X			X						X	X	X		X	X	Replace OD fan motor
Over charge	X	X	X	X	X		X			X			X			X			X	Recover Part of Charge
Under charge	X	X	X			X		X	X			X				X		X		Test for Leaks, Add Refrigerant
Leak	X	X	X			X		X	X			X		X	X	X		X		Specify and Repair the leak point
OD Control Board Failure																			X	Replace OD Control Board
ID Failure	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	Replace ID
Compressor failure	X	X	X			X					X			X	X	X		X	X	Replace Compressor
Compressor and Gas furnace are operating at the same time																			X	-
Cooling loop is not attached														X	X	X				Attach Cooling loop to Cold plate
Cooling loop grease is not enough														X	X	X				Add grease
Low ID CFM		X		X						X		X	X	X	X	X			X	Check Airflow Trim, Check ID fan motor; Repair/replace if needed

Outdoor Normal Temperature Operating Range: 67-115°F / Indoor Normal Temperature Operating Range: 65 - 85°F

SERVICING

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NOTE: Please refer to the Service Manual of each unit about the Gas Furnaces and Modular Blower.

⚠ WARNING

HIGH VOLTAGE!
Disconnect ALL power before servicing or installing. Multiple power sources may be present. Failure to do so may cause property damage, personal injury or death.



SERVICING

S-1 CHECKING VOLTAGE

1. Remove outer case, control panel cover, etc., from unit being tested.

With power ON:

⚠ WARNING

LINE VOLTAGE NOW PRESENT.

2. Using a voltmeter, measure the voltage across terminals L1 and L2 of the contactor for the condensing unit or at the field connections for the indoor units or heaters.

   ComfortNet™ Ready Condensing Units: Measure the voltage across the L1 and L2 terminals.

3. No reading - indicates open wiring, open fuse(s), no power or etc., from unit to fused disconnect service. Repair as needed.

4. With ample voltage at line voltage connectors, energize the unit.

Unit Type	Unit Supply Voltage (VAC)		
	Voltage	Min.	Max.
Outdoor Unit, Modular Blower, Heater Kit	208/230	197	253
Gas Furnaces	115	103	126
Cased Coil (CAPE(A)*/CHPE*)	24	22.6	25.5

NOTE: When operating electric heaters on voltages other than 240 volt, refer to the System Operation section on electric heaters to calculate temperature rise and airflow. Low voltage may cause insufficient heating.

S-2 CHECKING WIRING

⚠ WARNING

HIGH VOLTAGE !

DISCONNECT ALL POWER BEFORE SERVICING OR INSTALLING. MULTIPLE POWER SOURCES MAY BE PRESENT. FAILURE TO DO SO MAY CAUSE PROPERTY DAMAGE, PERSONAL INJURY OR DEATH.



1. Check wiring visually for signs of overheating, damaged insulation and loose connections.

2. Use an ohmmeter to check continuity of any suspected open wires.

3. If any wires must be replaced, replace with comparable gauge and insulation thickness.

S-3 CHECKING THERMOSTAT AND WIRING

ComfortNet™ Ready Models

Communicating Thermostat Wiring: The maximum wire length for 18 AWG thermostat wire is 250 feet.

S-3A THERMOSTAT AND WIRING

⚠ WARNING

LINE VOLTAGE NOW PRESENT.

With power ON, thermostat calling for cooling.

1. Use a voltmeter to check for 24 volt at thermostat wires C and R in the indoor unit control panel.

2. No voltage indicates trouble in the thermostat, wiring or transformer source.

3. Check the continuity of the thermostat and wiring. Repair or replace as necessary.

Resistance Heaters

1. Set room thermostat to a higher setting than room temperature so both stages call for heat.

2. With voltmeter, check for 24 volt at each heater relay.

3. No voltage indicates the trouble is in the thermostat or wiring.

4. Check the continuity of the thermostat and wiring. Repair or replace as necessary.

NOTE: Consideration must be given to how the heaters are wired (O.D.T. and etc.). Also safety devices must be checked for continuity.

SERVICING

S-3E CTK04** COMFORTNET™ THERMOSTAT

Overview

The ComfortNet™ system (or CT system) is a system that includes a ComfortNet compatible modular blower and air conditioner with a CTK04** thermostat. The table below compares the valid CT systems.

CT compatible Indoor Units	*CT compatible Air Conditioner*	*Full CT system benefits & features*

A ComfortNet air conditioning system differs from a legacy/traditional system in the manner in which the indoor unit, outdoor unit and thermostat interact with one another. In a traditional system, the thermostat sends commands to the indoor and outdoor units via analog 24 VAC signals. It is a one-way communication path in that the indoor and outdoor units typically do not return information to the thermostat.

On the other hand, the indoor unit, outdoor unit, and thermostat comprising a ComfortNet system "communicate" digitally with one another. It is now a two-way communications path. The thermostat still sends commands to the indoor and outdoor units. However, the thermostat may also request and receive information from both the indoor and outdoor units. This information may be displayed on the CT thermostat. The indoor and outdoor units also interact with one another. The outdoor unit may send commands to or request information from the indoor unit. This two-way digital communications between the thermostat and subsystems (indoor/outdoor unit) and between subsystems is the key to unlocking the benefits and features of the ComfortNet system.

Two-way digital communications is accomplished using only two wires. The thermostat and subsystem controls are powered with 24 VAC. Thus, a maximum of 4 wires between the equipment and thermostat is all that is required to operate the system.

CTK04 Wiring

NOTE: Use thermostat model that is CTK04AE or Daikin approved communication thermostat.

NOTE: A removable plug connector is provided with the control to make thermostat wire connections. Remove the plug, connect the wires to the plug, and then replace.

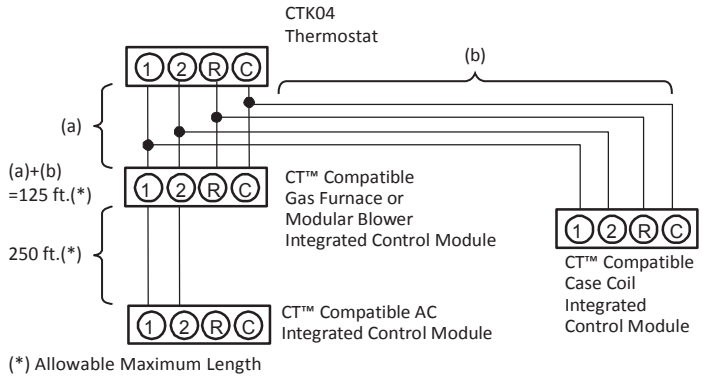
It is **strongly** recommended that you do not connect multiple wires into a single terminal.

Wire nuts are recommended to ensure one wire is used for each terminal. Failure to do so may result in intermittent operation.

Typical 18 AWG thermostat wire may be used to wire the system components. However, communications reliability may be improved by using a high quality, shielded, twisted pair cable for the data transmission lines.

Two-Wire Outdoor, Four-Wire Indoor Wiring

Typical wiring will consist of two wires between the indoor unit and air conditioner, and four wires between the indoor unit and thermostat. The figure that follows shows the required wires: data lines, 1 and 2; "R" (24 VAC hot) and "C" (24 VAC common).



System Wiring

S-4 CHECKING TRANSFORMER AND CONTROL CIRCUIT

⚠ WARNING

HIGH VOLTAGE !

Disconnect ALL power before servicing or installing. Multiple power sources may be present. Failure to do so may cause property damage, personal injury or death.



A step-down transformer (208/230 or 115 volt primary to 24 volt secondary) is provided with each indoor unit. This allows ample capacity for use with resistance heaters. The outdoor sections do not contain a transformer (see indoor unit WIRING DIAGRAMS on page 87).

⚠ WARNING

Disconnect ALL power before servicing.

1. Remove control panel cover, or etc., to gain access to transformer.

With power ON:

⚠ WARNING

Line Voltage now present.

2. Using a voltmeter, check voltage across secondary voltage side of transformer (R to C).
3. No voltage indicates faulty transformer, bad wiring, or bad splices.
4. Check transformer primary voltage at incoming line voltage connections and/or splices.
5. If line voltage available at primary voltage side of transformer and wiring and splices are good, transformer is inoperative. Replace the transformer.

SERVICING

Thermostat Menu Screen

System Startup Test (In Case of CTK04)

NOTICE

On initial power startup, the AIR CONDITIONER will display code E11, signaling that initial SYSTEM test must be run. Follow the ComfortNet™ setup screen to enter application-unique information. See ComfortNet thermostat manual for detailed information.

A system test is now required to check the equipment settings and functionality. Once selected, it checks the equipment for approximately 10 - 15 minutes. System test may exceed 15 minutes if there is an error. Refer to the Troubleshooting section, if error code appears.

Before starting the SYSTEM TEST, turn off the electric heater or gas furnace.

1. Ensure the thermostat is installed.
2. Apply power to outdoor and indoor units.
3. ***Startup.***
   After the application information is entered, the initial system test must be run.

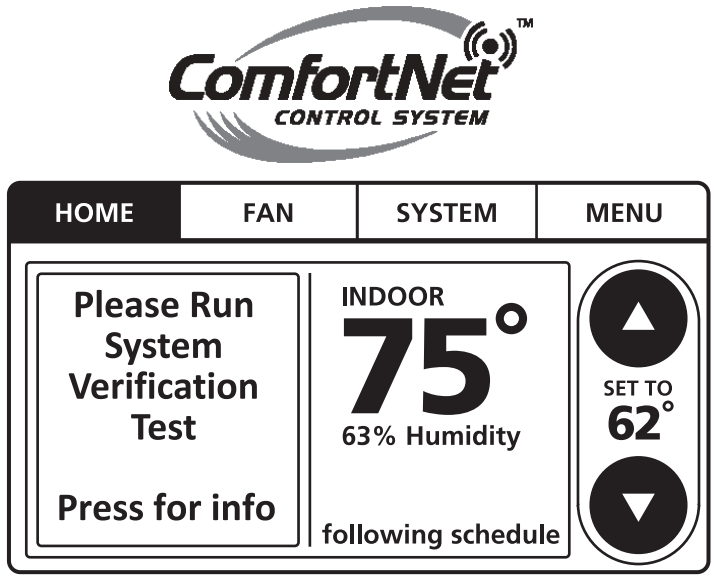
   The “HOME” screen will be displayed showing information similar to one of the adjacent screens.

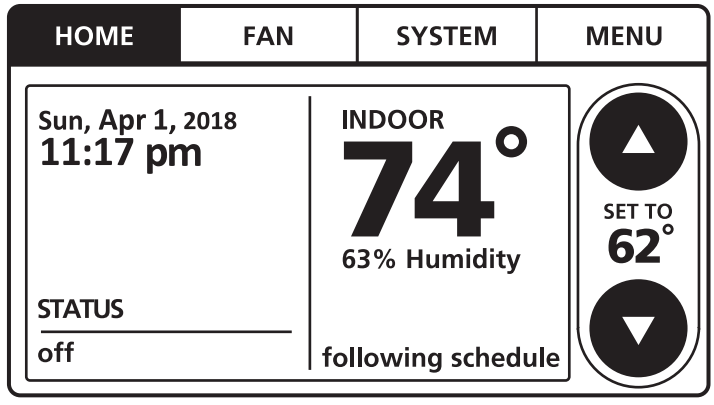
   Select “MENU”. Make sure the thermostat is in “OFF” and select “SYSTEM” menu. Choose “OFF” before “SYSTEM TEST”.

   NOTE:

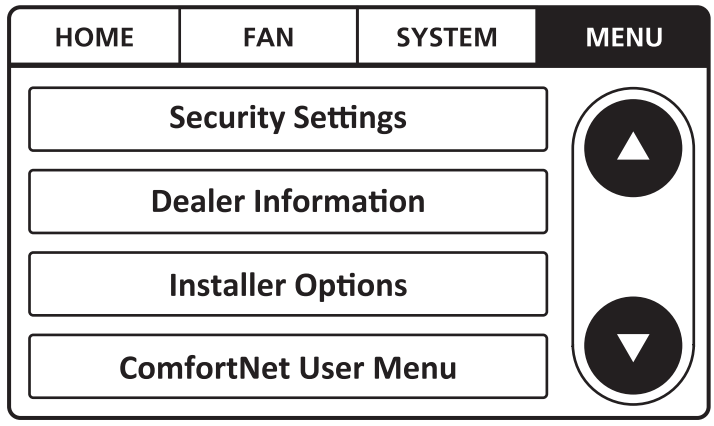
   “SYSTEM TEST” must be run for all installations.

   System will not operate without a completed initial “SYSTEM TEST”.

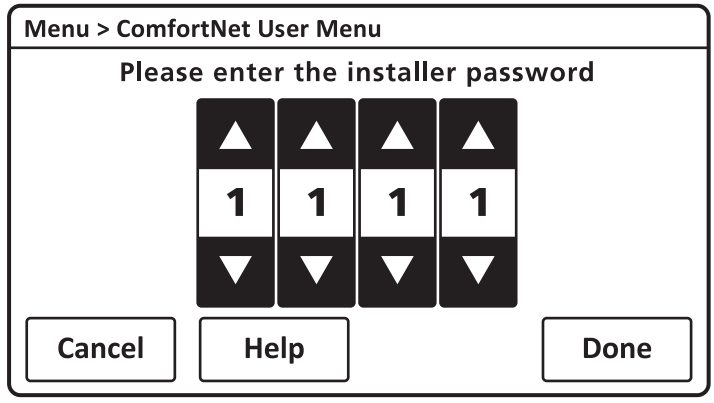




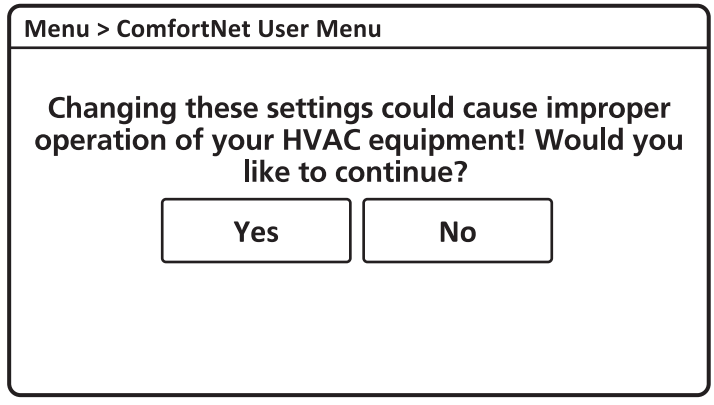
4. From the “MENU” screen, scroll down and select “ComfortNet User Menu”.



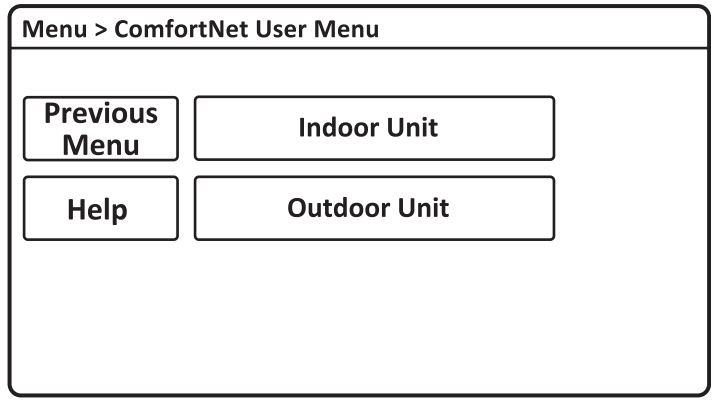
5. Enter Installer password. (The password is the Date Code located on the thermostat and is available by entering the “EQUIPMENT STATUS” menu and scrolling to the bottom.)



6. Confirm message, then select “YES” to continue.

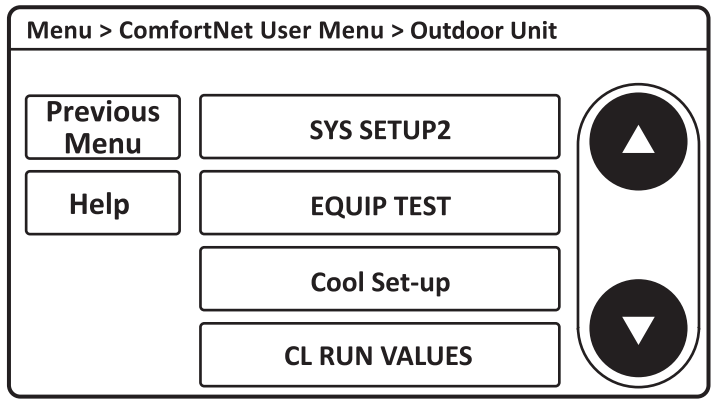


7. From the “ComfortNet User Menu”, select “Outdoor Unit”.

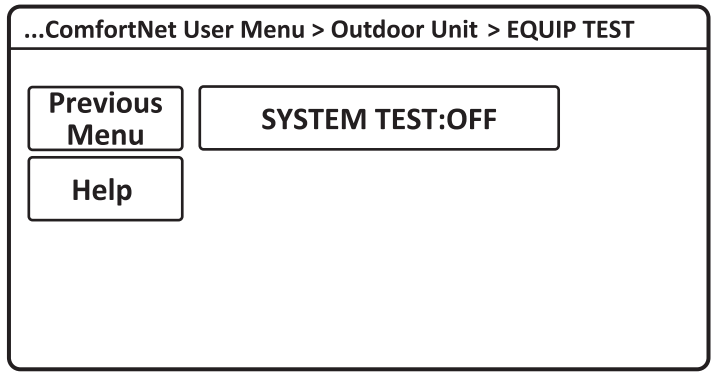


SERVICING

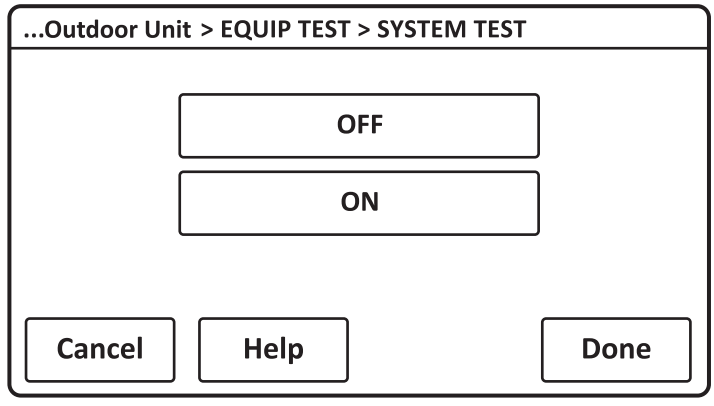
8. Next, scroll down and select “EQUIP TEST”.



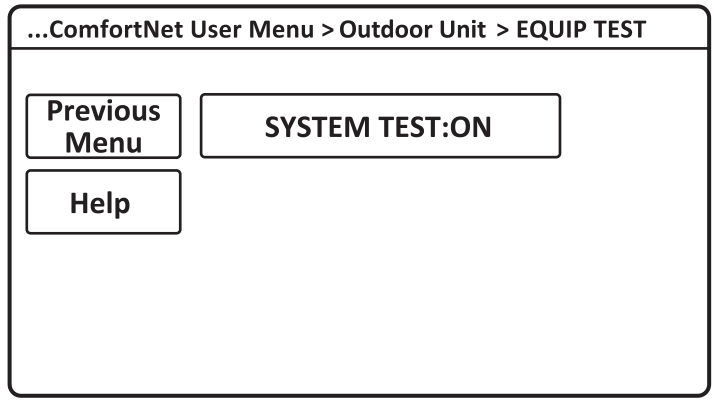
9. Select “SYSTEM TEST”.
   NOTE: If unit has Error during system test, it may be under charge.
   Please refer “TROUBLESHOOTING” for your corrective action.



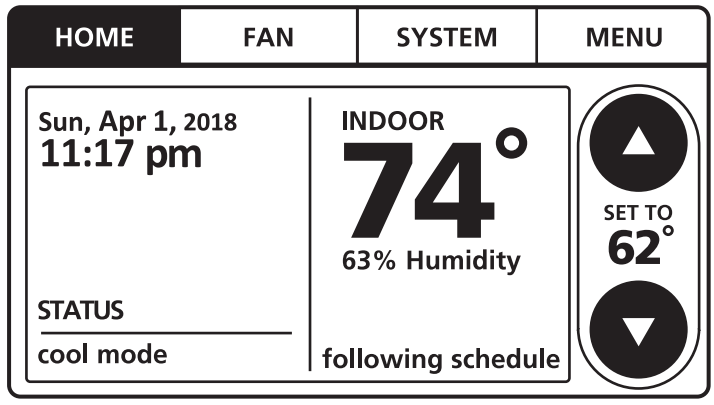
10. Select “ON” to run the “SYSTEM TEST”.
    Press “DONE” to initiate test.



11. Allow the system test to run for its duration (10-15 minutes). “EQUIP TEST” screen will show the system test is “ON” once selected.
    System test will operate the air conditioner and the indoor unit through a series of startup tests.
    Please proceed to the next step and allow for startup tests to complete. Do not interrupt power to air conditioner, indoor unit, or thermostat during system test.



12. Press Previous Menu button and navigate to “HOME” screen and allow test to finish. The display similar to the one at the right will be displayed after “SYSTEM TEST” completes. Test is complete only when “CODE 11” notice clears from BOTH the thermostat display AND the seven segment LED display on the air conditioner. Please wait for test to complete and for both codes to clear.



Set Thermostat to CHARGE MODE (In Case of CTK04)

If required additional charging amount cannot be charged to the system without operation, then use this “CHARGE MODE”.

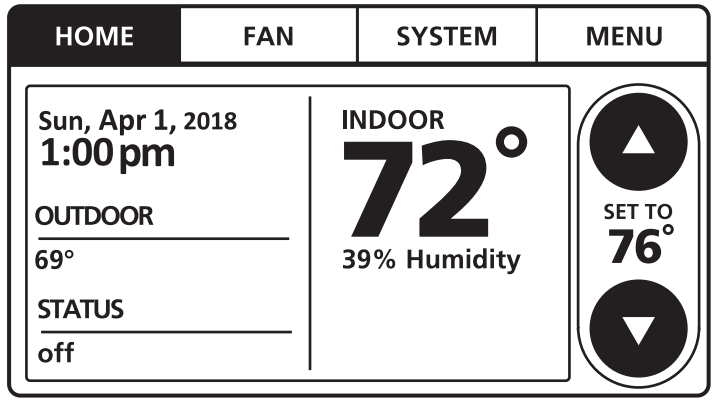
Please follow the following sequence to enter CHARGE MODE.

When adjusting “Sub cooling”, use this “CHARGE MODE”.

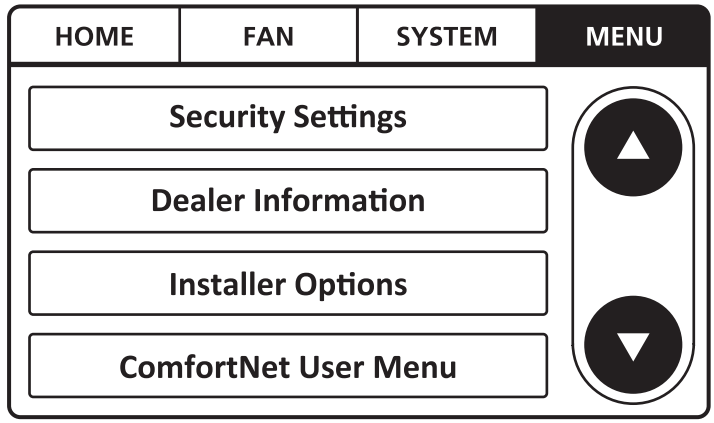
CHARGE MODE allows for charging of the system. System operates for a duration of approximately one hour while the equipment runs at full capacity. After one hour, the CHARGE MODE ends and the system resumes normal thermostat operation.

Before starting the CHARGE MODE, turn off the electric heater.

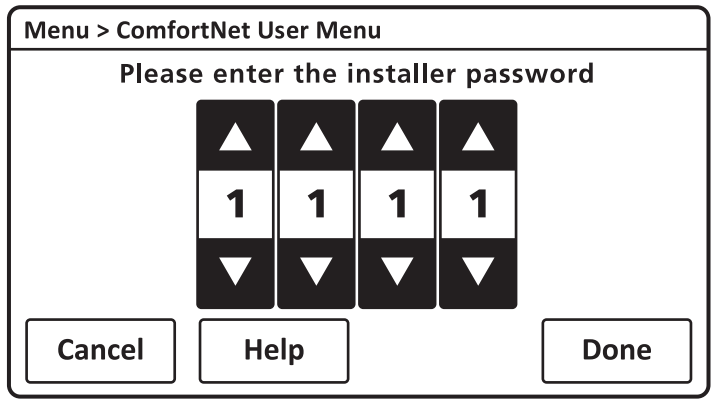
1. On the “HOME” screen, select “MENU”.
   NOTE: Ensure the thermostat is in OFF. Select “SYSTEM” menu. Choose “OFF” before “CHARGE MODE”.



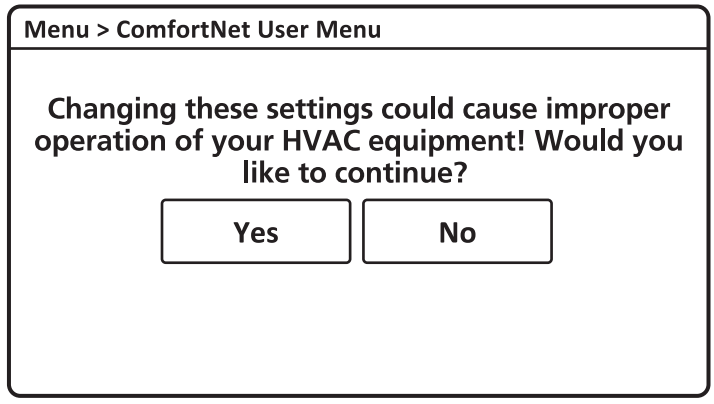
2. From the “MENU” screen, scroll down and select “ComfortNet User Menu”.



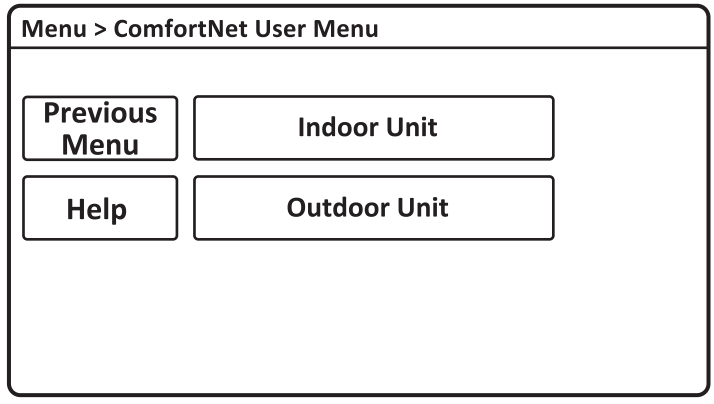
3. Enter Installer password. (The password is the Date Code located on the thermostat and is available by entering the “EQUIPMENT STATUS” menu and scrolling to the bottom).



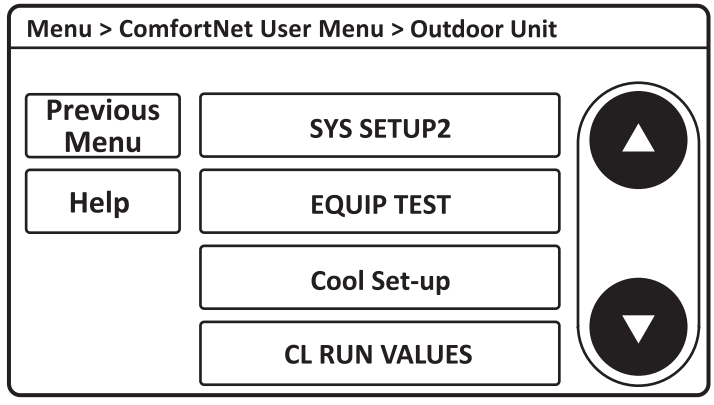
4. Confirm message, then select “Yes” to continue.



5. From the “ComfortNet User Menu”, select “Outdoor Unit”.

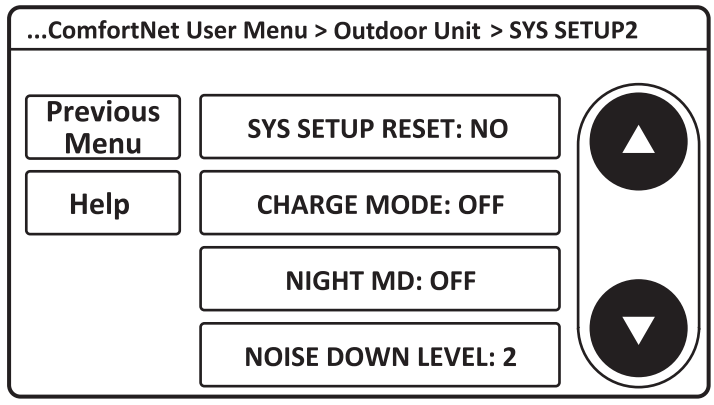


6. From the “Outdoor Unit”, scroll down and select “SYS SETUP2”.

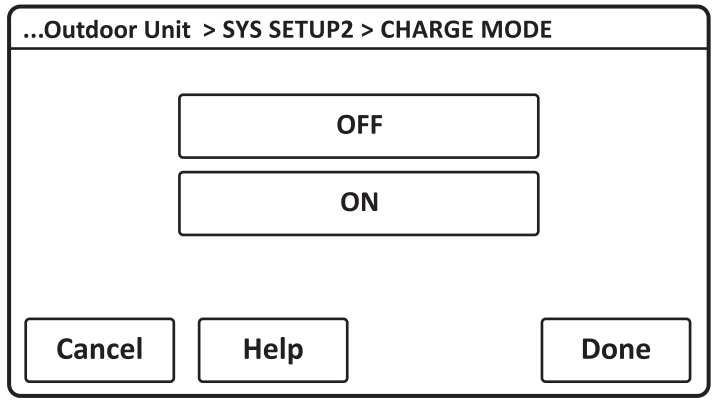


SERVICING

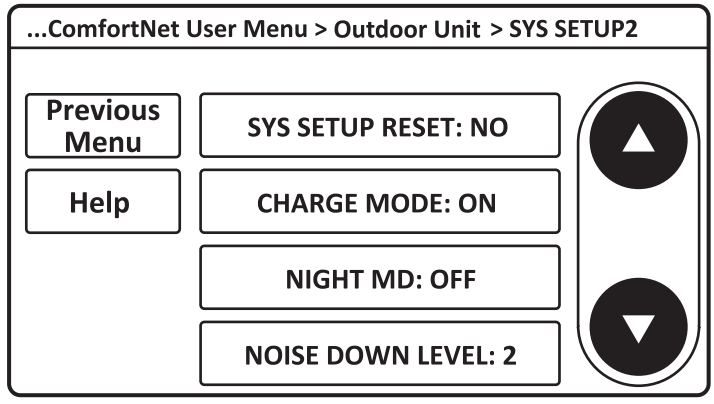
7. Select “CHARGE MODE”.



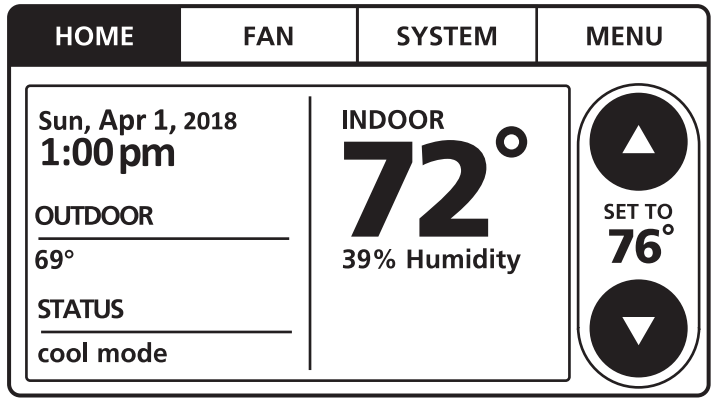
8. Select “ON”. Press “DONE” to initiate CHARGE MODE.
   If charging is not complete after 1 hour, repeat 7. and 8.
   Refer to STEP 5 and STEP 6 for refrigerant charge level adjustment.
   System will then run for 1 hour and either return to cooling mode.



9. To terminate “CHARGE MODE”, select “CHARGE MODE” screen again. Press “OFF”. Press “DONE” to terminate CHARGE MODE.



10. Once CHARGE MODE is complete and has been terminated, navigate to “HOME” screen.
    Enter normal operation with temperature offset or thermostat schedule, as desired.



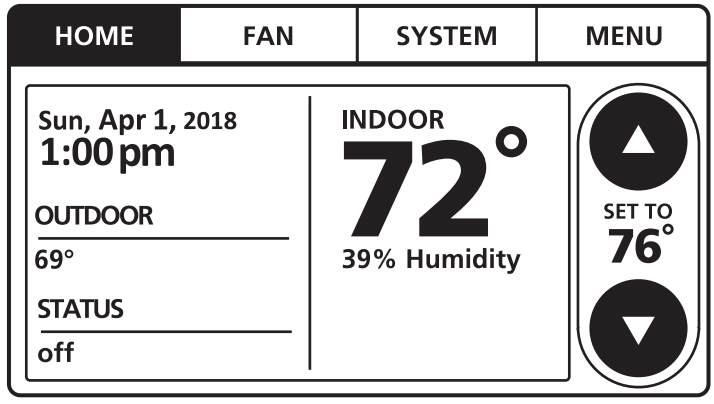
SERVICING

Set Thermostat to Adjust Maximum Compressor Speed

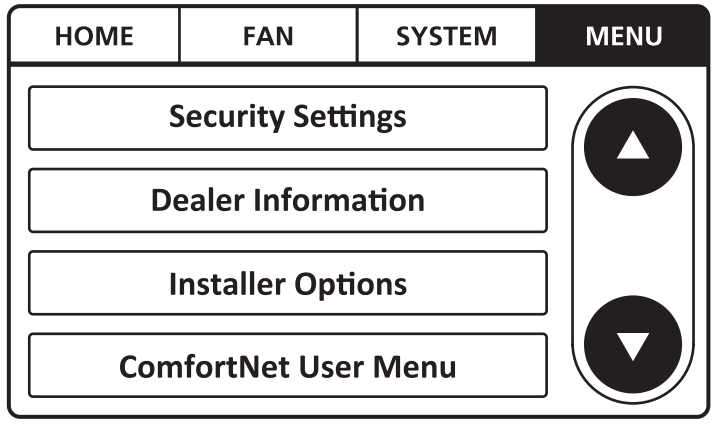
Please follow the following sequence to enter MAXIMUM compressor speed.

Maximum compressor speed at which the outdoor unit will operate can be changed using thermostat. Maximum compressor speed can be changed to get the required capacity or efficiency. Once the maximum speed is set, the system operates between the set maximum speed and default low speed.

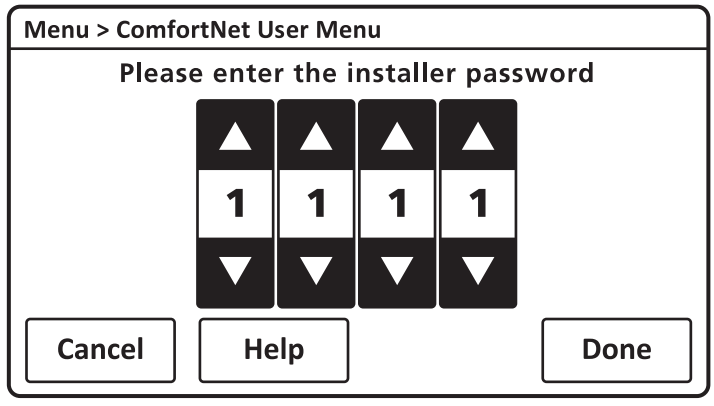
1. On the “HOME” screen, select “MENU”.



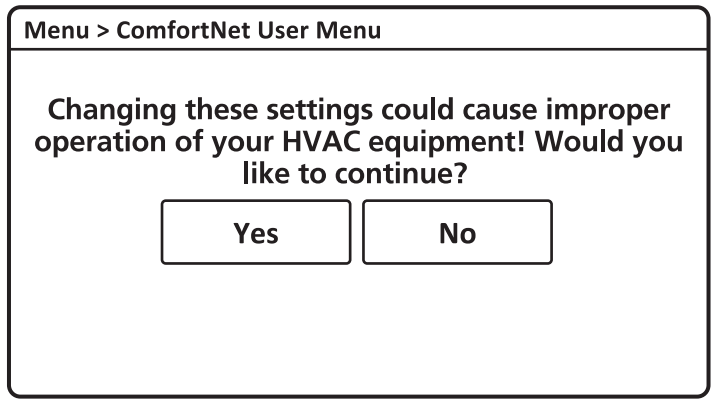
2. From the “MENU” screen, scroll down and select “ComfortNet User Menu”.



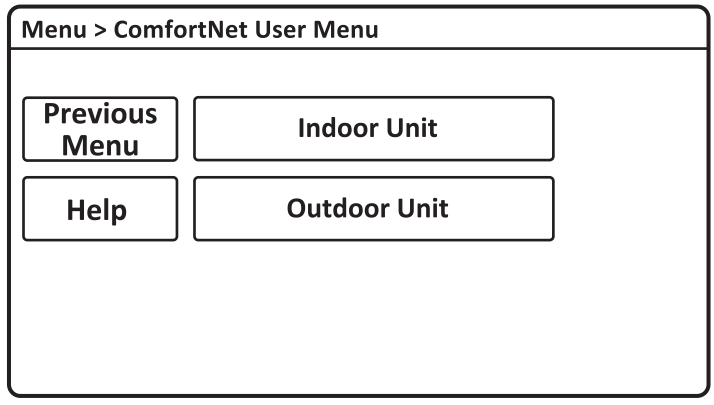
3. Enter Installer password. (The password is the Date Code located on the thermostat and is available by entering the “EQUIPMENT STATUS” menu and scrolling to the bottom).



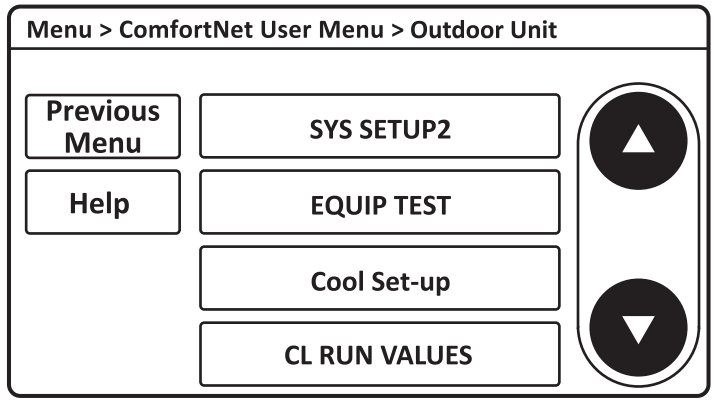
4. Confirm message, then select “Yes” to continue.



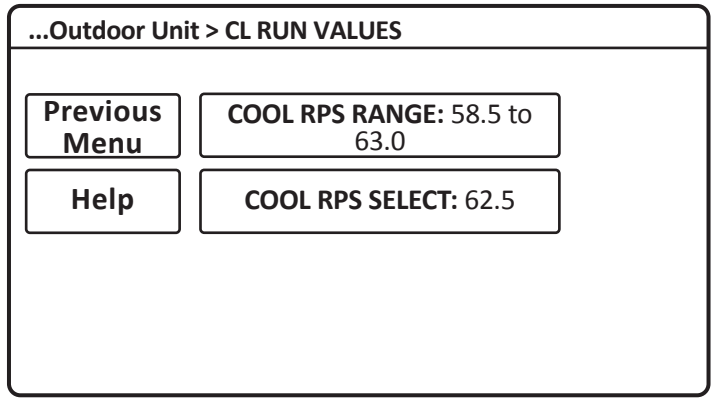
5. From the “ComfortNet User Menu”, select “Outdoor Unit”.



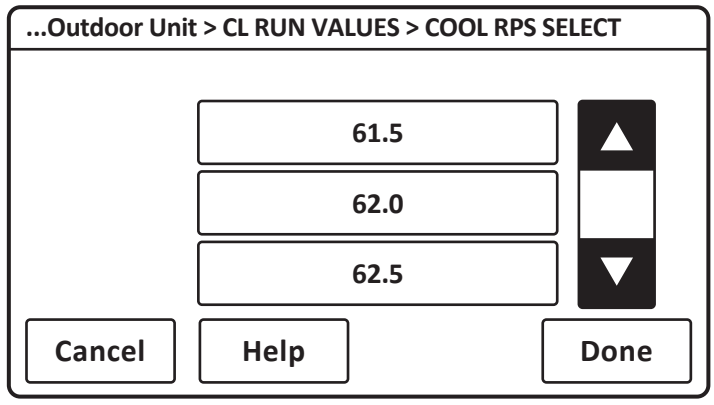
6. From the “Outdoor Unit”, scroll down and select “CL RUN VALUES”.



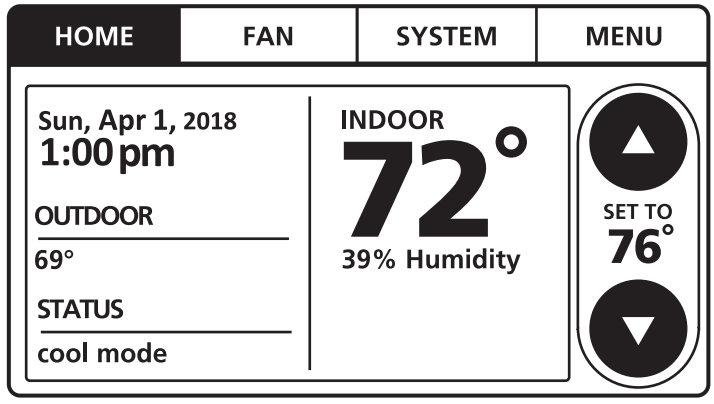
7. Select “COOL RPS RANGE”.
   Press “COOL RPS RANGE” to select the range in which the desired Maximum compressor speed falls.



8. Select “COOL RPS SELECT”.
   Select the desired Maximum compressor speed.

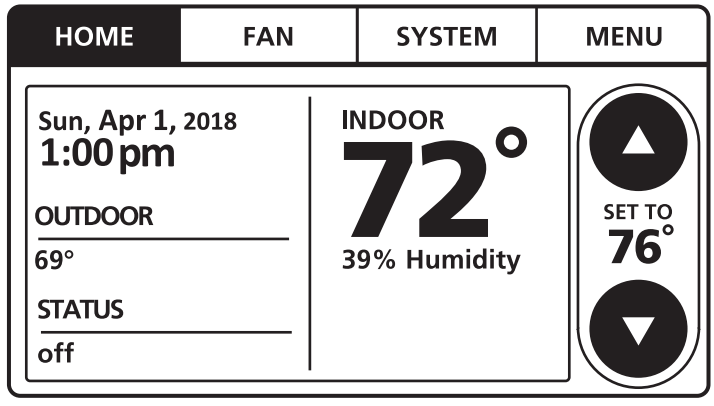


9. Once Maximum compressor speed is set, navigate to “HOME” screen. Enter normal operation with temperature offset or thermostat schedule, as desired.

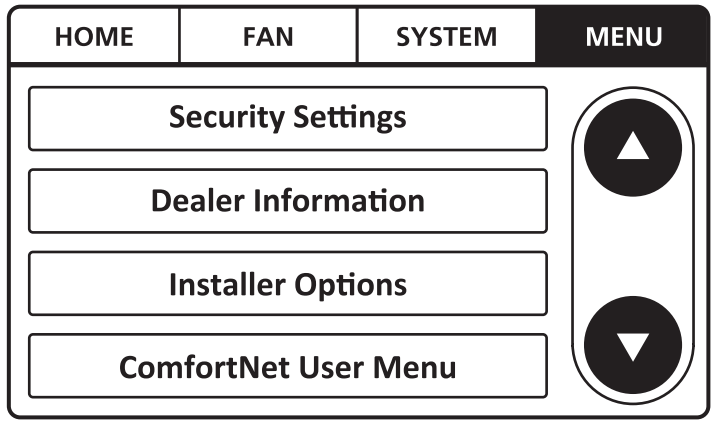


Set Thermostat to Adjust Indoor Air CFM trim

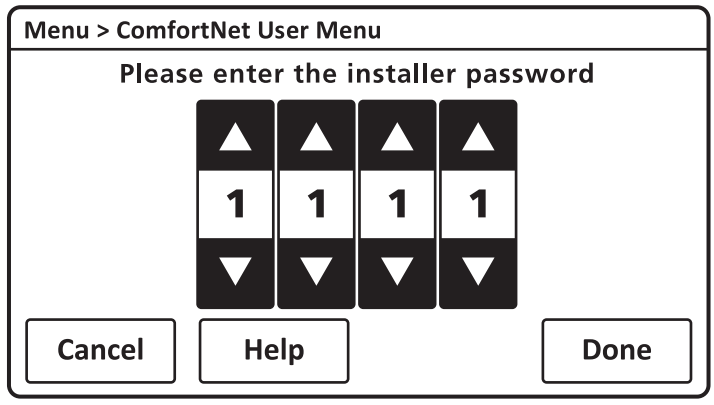
1. On the “HOME” screen, select “MENU”.



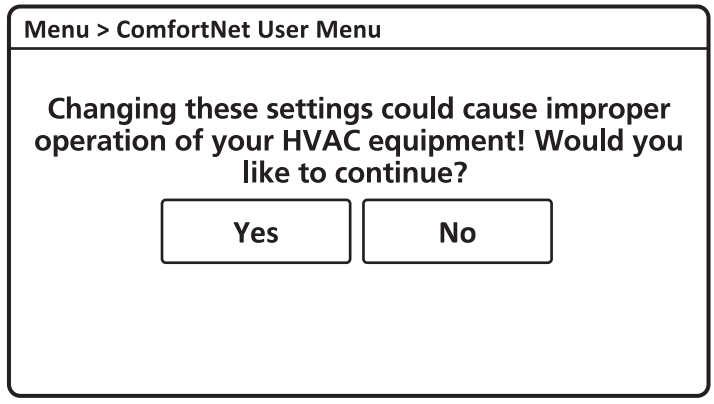
2. From the “MENU” screen, scroll down and select “ComfortNet User Menu”.



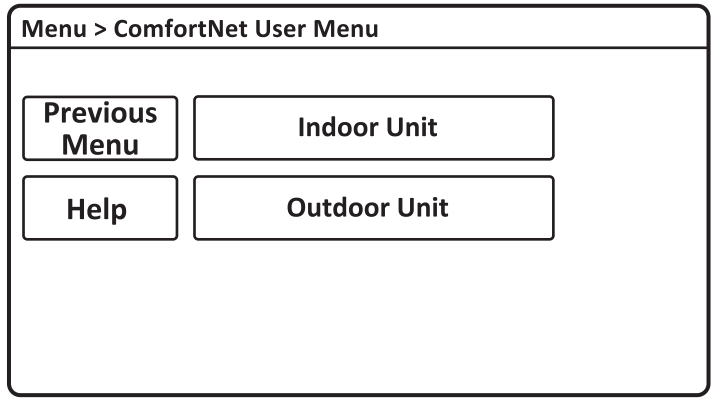
3. Enter Installer password. (The password is the Date Code located on the thermostat and is available by entering the “EQUIPMENT STATUS” menu and scrolling to the bottom).



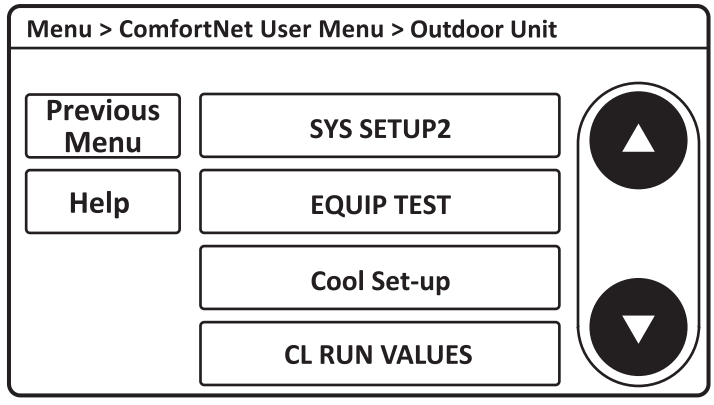
4. Confirm message, then select “Yes” to continue.



5. From the “ComfortNet User Menu”, select “Outdoor Unit”.

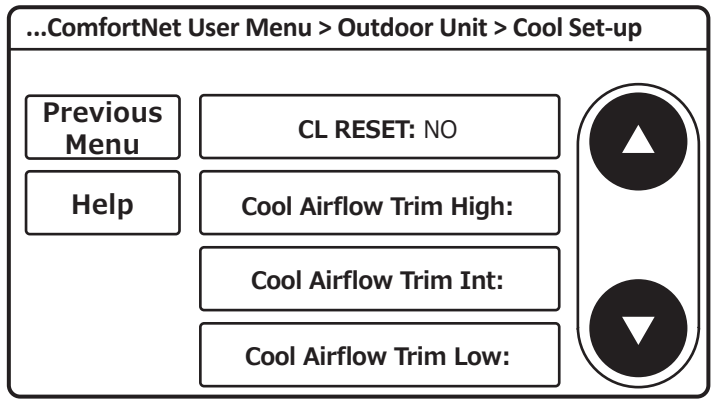


6. From the “Outdoor Unit”, scroll down and select “Cool Set-up”.

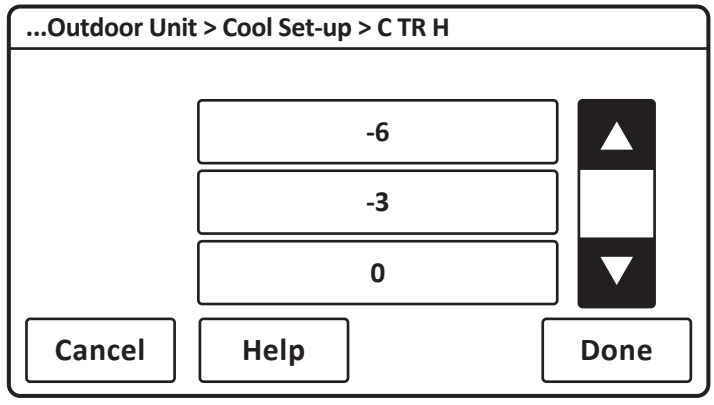


SERVICING

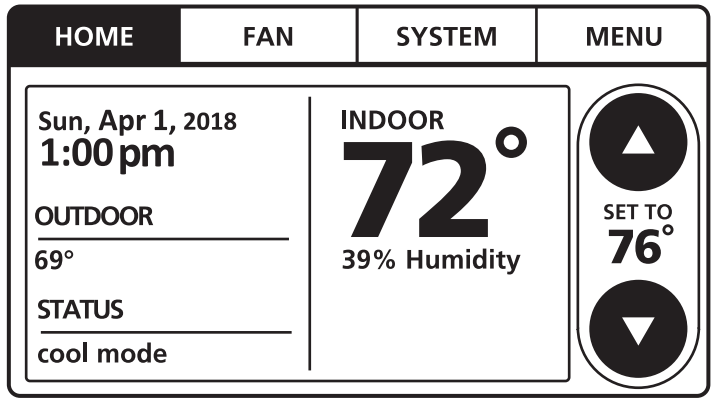
7. User can change the airflow trim at high, intermediate and low compressor for cooling mode.
   Select:
   Cool Airflow Trim High: high speed cooling
   Cool Airflow Trim Int: intermediate speed cooling
   Cool Airflow Trim Low: low speed cooling



   Under each criteria, a selection between +15% to -15% in the increment of 3% can be made.



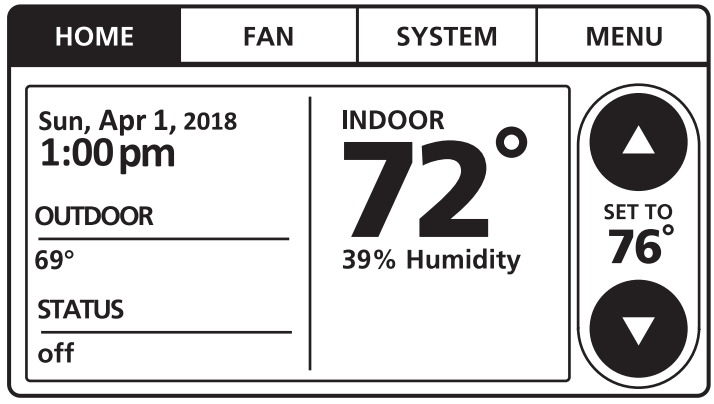
8. Once “Cool Airflow Trim” is set, navigate to “HOME” screen. Enter normal operation with temperature offset or thermostat schedule, as desired.



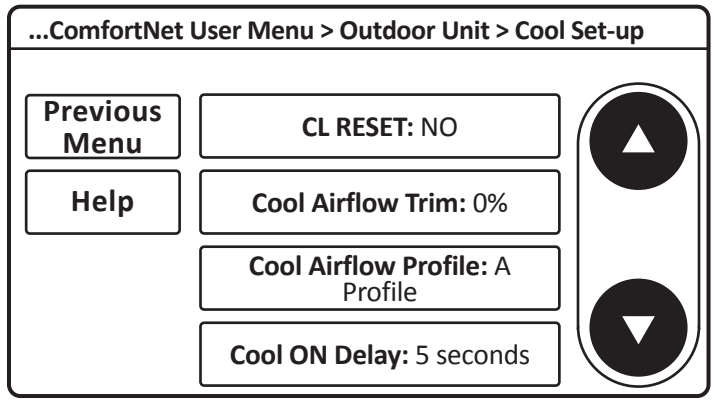
SERVICING

SET THERMOSTAT TO ADJUST INDOOR AIRFLOW PROFILE, COOL ON DELAY AND COOL OFF DELAY

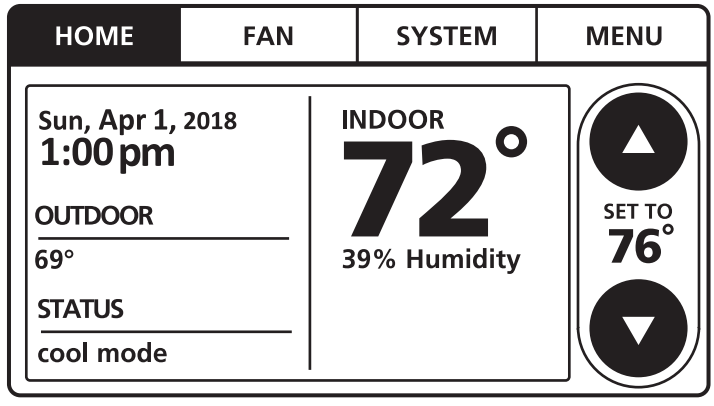
1. Please follow the sequence 1. to .6 of ***SET THERMOSTAT TO ADJUST INDOOR AIR CFM TRIM*** on page 31.



2. Select “Cool Airflow Profile”, “Cool ON Delay” or “Cool OFF Delay”. Check the installation manual of the indoor unit for more details.



3. Once “Cool Airflow Profile”, “Cool ON Delay” or “Cool OFF Delay” is set, navigate to “HOME” screen.

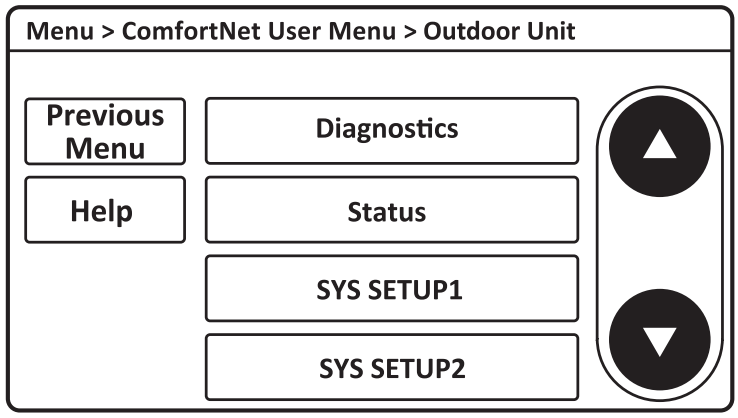


SERVICING

Set Thermostat to Check SYSTEM STATUS

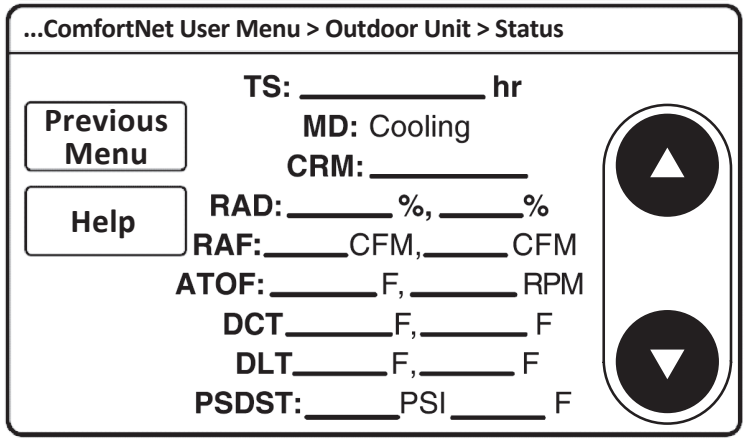
1. Follow the sequence 1. to 5. of ***Set Thermostat to Adjust Indoor Air CFM trim*** on page 31.

2. Select “Status”.



3. Follow screen for System Status.

TS	Time Stamp
MD	Mode
CRM	Compressor Reduction Mode
RAD	Requested and Actual % Demand
RAF	Requested and Reported ID CFM
ATOF	Outdoor Air Temperature and Outdoor Fan RPM
DCT	Discharge Temperature and Outdoor Coil Temperature
DLT	Outdoor Liquid Temperature
PSDST	Pressure Sensor and Outdoor Suction Temperature



Time Stamp: Provides compressor run time in hours.

Mode: Current system operational mode (COOLING, COOLING STARTUP, OIL RETURN, STOP).

SERVICING

S-12 CHECKING HIGH PRESSURE SWITCH

WARNING

HIGH VOLTAGE !

DISCONNECT ALL POWER BEFORE SERVICING OR INSTALLING. MULTIPLE POWER SOURCES MAY BE PRESENT. FAILURE TO DO SO MAY CAUSE PROPERTY DAMAGE, PERSONAL INJURY OR DEATH.



The high pressure switch senses the pressure in the compressor discharge line. If abnormally high condensing pressures develop, the contacts of the control open, breaking the control circuit before the compressor motor overloads. This control is automatically reset.

1. Using an ohmmeter, check across terminals of high pressure control, with wire removed. If not continuous, the contacts are open.
2. Attach a gauge to the dill valve port on the base valve.

With power ON:

WARNING

LINE VOLTAGE NOW PRESENT.

3. Start the system in charge mode and place a piece of cardboard in front of the condenser coil, raising the condensing pressure.
4. Check pressure at which the high pressure control cuts-out. If it cuts-out at 605 PSIG to -17 PSIG, it is operating normally (See causes for high head pressure in COOLING ANALYSIS CHART on page 19). If it cuts out below this pressure range, replace the control.

S-13 CHECKING INDOOR/OUTDOOR LOW PRESSURE SENSOR

With power ON:

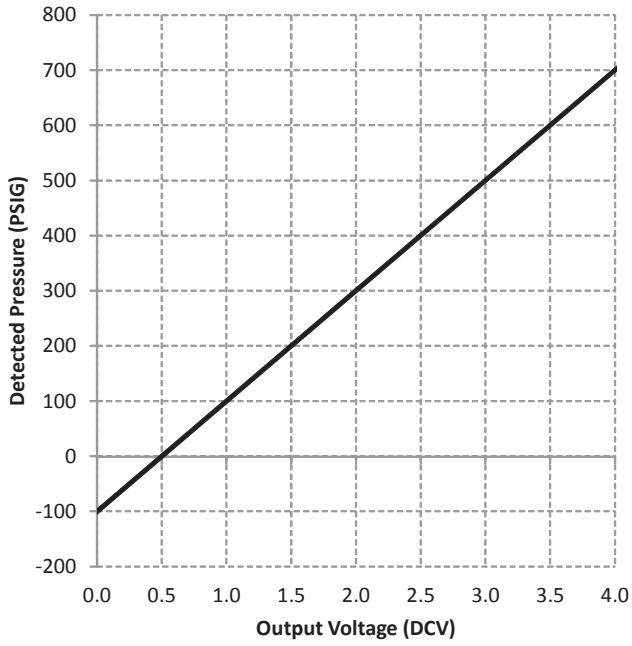
WARNING

LINE VOLTAGE NOW PRESENT.

The LOW and indoor pressure sensor senses the suction pressure in cooling mode.

Follow the following sequence to check the pressure sensor.

1. Connect a voltmeter across the sensor terminals between black and white wirings. The voltmeter should show the voltage in the following table.
2. Replace the sensor if the sensor is open, shorted or outside the valid voltage range.



VOLTAGE VS PRESSURE CHARACTERISTICS

S-15A RESISTANCE CHECK

WARNING

HIGH VOLTAGE !

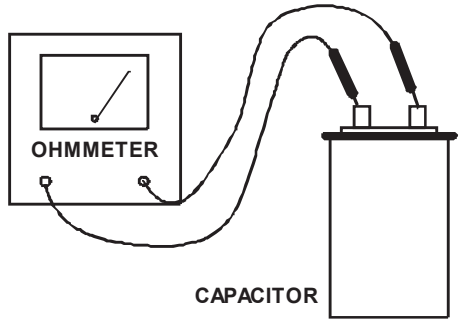
DISCONNECT ALL POWER BEFORE SERVICING OR INSTALLING. MULTIPLE POWER SOURCES MAY BE PRESENT. FAILURE TO DO SO MAY CAUSE PROPERTY DAMAGE, PERSONAL INJURY OR DEATH.



1. Discharge capacitor and remove wire leads.

WARNING

DISCHARGE CAPACITOR THROUGH A 20 TO 30 OHM RESISTOR BEFORE HANDLING.



TESTING CAPACITOR RESISTANCE

2. Set an ohmmeter on its highest ohm scale and connect the leads to the capacitor.

A. Good Condition - indicator swings to zero and slowly returns to infinity. (Start capacitor with bleed resistor will not return to infinity. It will still read the resistance of the resistor).

B. Shorted - indicator swings to zero and stops there - replace.

C. Open - no reading - replace. (Start capacitor would read resistor resistance.)

CAPE(A)/CHPE with DX17VSS Condenser and CTK04 Communicating Thermostat

The CAPE(A)/CHPE cased coil/gas furnaces/modular blower matched with a DX17VSS condensing unit and CTK04 communicating thermostat constitute a network. The four components, or subsystems, making up the system communicate with one another with information passed between all four components. This leads to a somewhat non-traditional manner in which the system components receive commands for system operation. All system commands are routed from the component through the network to the appropriate destination component.

NOTE: The individual subsystems will cease operation if the request for operation is NOT refreshed after 5 minutes. This is a built-in safe guard to prevent the possibility of runaway operation.

1.0 Cooling Operation - Variable Speed Cooling

1.1 The CTK04* thermostat sends a request for cooling through the network to the unitary (UC) control in the condenser. The UC control receives the command and processes any compressor and fan delays.

1.2 The UC control sends a request for fan speed to the indoor unit. The blower energizes the ECM blower motor at the appropriate speed.

1.3 The condenser operates the compressor and condenser fan motor at the appropriate speeds.

1.4 The system operates at cooling.

1.5 Once the thermostat demand is satisfied, the CTK04* thermostat commands the UC control to end cooling operation. The condenser stops the compressor and condenser fan motor. The UC control continues providing a fan request until any cooling blower OFF delays have expired.

2.0 Continuous Fan Operation

2.1 With a demand for continuous fan operation, the CTK04* thermostat sends a fan request to the integrated indoor unit control along with a fan demand. The control energizes the variable speed ECM motor at fan demand provided by the thermostat. The fan demand provided by the thermostat will be 30%, 50% or 70% of the indoor unit's maximum airflow capability. The continuous fan demand is set from the thermostat as low, medium, or high.

2.2 If the thermostat demand for continuous fan is removed, the CTK04* thermostat commands the integrated indoor unit control to end continuous fan operation. The integrated indoor unit control immediately de-energizes the ECM blower motor.

3.0. Airflow Consideration

Airflow demands are managed differently in a fully communicating system than in a non-communicating wired system. The system operating mode (as determined by the thermostat) determines which unit calculates the system airflow demand. If the indoor unit is responsible for determining the airflow demand, it calculates the demand and sends it to the ECM motor. If the outdoor unit or thermostat is responsible for determining the demand, it calculates the demand and transmits the demand along with a fan request to the indoor unit. The indoor unit then sends the demand to the ECM motor. The table below lists the various ComfortNet™ systems, the operating mode, and airflow demand source.

System	System Operating Mode	Airflow Demand Source
Air Conditioner + Indoor Unit	Cooling	Air Conditioner
	Heating	Indoor Unit
	Continuous Fan	Thermostat

For example, assume the system is an air conditioner matched with an indoor unit. With a call for cooling, the air conditioner will calculate the system's cooling airflow demand. The air conditioner will then send a fan request along with the cooling airflow demand to the indoor unit. Once received, the indoor unit will send the cooling airflow demand to the ECM motor. The ECM motor then delivers the cooling airflow. See the applicable ComfortNet™ air conditioner installation manual for the airflow delivered during cooling.
In continuous fan mode, the CTK04* thermostat provides the airflow demand. The CTK04* provides 4 continuous fan speeds (25%, 50%, 75% and 100% of maximum airflow). During continuous fan operation, the thermostat sends a fan request along with the continuous fan demand to the indoor unit. The indoor unit, in turn, sends the demand to the ECM motor. The ECM motor delivers the requested continuous fan airflow.

SERVICING

S-17 CHECKING COMPRESSOR

WARNING

Hermetic compressor electrical terminal venting can be dangerous. When insulating material which supports a hermetic compressor or electrical terminal suddenly disintegrates due to physical abuse or as a result of an electrical short between the terminal and the compressor housing, the terminal may be expelled, venting the vapor and liquid contents of the compressor housing and system.

If the compressor terminal PROTECTIVE COVER and gasket (if required) are not properly in place and secured, there is a remote possibility if a terminal vents, that the vaporous and liquid discharge can be ignited, spouting flames several feet, causing potentially severe or fatal injury to anyone in its path.

This discharge can be ignited external to the compressor if the terminal cover is not properly in place and if the discharge impinges on a sufficient heat source.

Ignition of the discharge can also occur at the venting terminal or inside the compressor, if there is sufficient contaminant air present in the system and an electrical arc occurs as the terminal vents.

Ignition cannot occur at the venting terminal without the presence of contaminant air, and cannot occur externally from the venting terminal without the presence of an external ignition source.

Therefore, proper evacuation of a hermetic system is essential at the time of manufacture and during servicing.

To reduce the possibility of external ignition, all open flame, electrical power, and other heat sources should be extinguished or turned off prior to servicing a system.

S-17A RESISTANCE TEST

Inverter on the outdoor control board takes the position signal from the UVW line connected with the compressor. When the system detects the malfunction on the compressor, check the insulation resistance in accordance with the following procedure.

WARNING

HIGH VOLTAGE!
Disconnect ALL power before servicing or installing. Multiple power sources may be present. Failure to do so may cause property damage, personal injury or death.

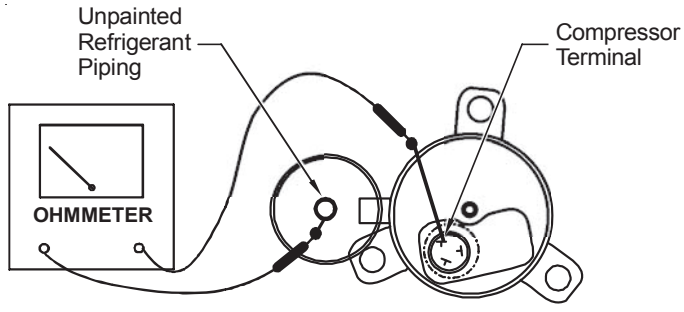


1. Remove the leads from the compressor terminals.

WARNING

See warnings S-17 before removing compressor terminal cover.

2. Check the wiring connection of UVW on compressor terminal.
3. Check the insulation resistance of compressor between the compressor terminal and unpainted refrigerant piping.



TESTING COMPRESSOR WINDINGS

NOTE: The compressor has terminal on the top.

SERVICING

S-17B GROUND TEST

If fuse, circuit breaker, GFCI (ground-fault circuit interrupter), etc., has tripped, this is a strong indication that an electrical problem exists and must be found and corrected. The circuit protective device rating must be checked, and its maximum rating should coincide with that marked on the equipment nameplate.

With the terminal protective cover in place, it is acceptable to replace the fuse or reset the circuit breaker ONE TIME ONLY to see if it was just a nuisance opening. If it opens again, DO NOT continue to reset.

Disconnect all power to unit, making sure that **all** power legs are open.

1. DO NOT remove protective terminal cover. Disconnect the three leads going to the compressor terminals at the nearest point to the compressor.
2. Identify the leads and using an ohmmeter on the R x 10,000 scale or the highest resistance scale on your ohmmeter check the resistance between each of the three leads separately to ground (such as an unpainted tube on the compressor).
3. If a ground is indicated, then carefully remove the compressor terminal protective cover and inspect for loose leads or insulation breaks in the lead wires.
4. If no visual problems indicated, carefully remove the leads at the compressor terminals.
5. Carefully retest for ground, directly between compressor terminals and ground.
6. If ground is indicated, replace the compressor. The resistance reading should be infinity. If there is any reading on meter, there is some continuity to ground and compressor should be considered defective.

WARNING

Damage can occur to the glass embedded terminals if the leads are not properly removed. This can result in terminal and hot oil discharging.

S-26 TESTING TEMPERATURE SENSORS AND EEV COIL RESISTANCE

The DX17VSS ComfortNet ready air conditioner and CAPE(A)/CHPE cased coil models are factory equipped with:

- (Ta) an outdoor air temperature sensor
- (Tm) an outdoor coil temperature sensor
- (Tl) an outdoor liquid temperature sensor
- (Td) a discharge temperature sensor
- (Tgi) an indoor gas temperature sensor
- (Tli) an indoor liquid temperature sensor
- (Ts) a suction temperature sensor

To check above sensors:

WARNING

HIGH VOLTAGE!
Disconnect ALL power before servicing or installing. Multiple power sources may be present. Failure to do so may cause property damage, personal injury or death.



1. Disconnect power to all equipments.
2. Disconnect the sensor connector from the electric board.
3. Connect an ohmmeter across the sensor terminals. The ohmmeter should read the resistance shown in the table THERMISTOR RESISTANCE AND TEMPERATURE CHARACTERISTICS. Replace the sensor if the sensor is open, shorted, or outside the valid resistance range.

Testing EEV Coil Resistance

To check the resistance of the EEV coil, first disconnect the EEV cable from the PCB board. Read resistance between the connect pins, and then make sure the resistance falls in the range of 40 to 50 Ω.

SERVICING

S-100 REFRIGERATION REPAIR PRACTICE

DANGER

Always remove the refrigerant charge in a proper manner before applying heat to the system.

When repairing the refrigeration system:

WARNING

HIGH VOLTAGE!
Disconnect ALL power before servicing or installing. Multiple power sources may be present. Failure to do so may cause property damage, personal injury or death.



1. Never open a system that is under vacuum. Air and moisture will be drawn in.
2. Plug or cap all openings.
3. Remove all burrs and clean the brazing surfaces of the tubing with sand cloth or paper. Brazing materials do not flow well on oxidized or oily surfaces.
4. Clean the inside of all new tubing to remove oils and pipe chips.
5. When brazing, sweep the tubing with dry nitrogen to prevent the formation of oxides on the inside surfaces.
6. Complete any repair by replacing the liquid line drier in the system, evacuate and charge.

BRAZING MATERIALS

IMPORTANT NOTE: Torch heat required to braze tubes of various sizes is proportional to the size of the tube. Tubes of smaller size require less heat to bring the tube to brazing temperature before adding brazing alloy. Applying too much heat to any tube can melt the tube. Service personnel must use the appropriate heat level for the size of the tube being brazed.

NOTE: The use of a heat shield when brazing is recommended to avoid burning the serial plate or the finish on the unit. Heat trap or wet rags should be used to protect heat sensitive components such as service valves, EEV and filters.

Copper to Copper Joints - Sil-Fos used without flux (alloy of 15% silver, 80% copper, and 5% phosphorous). Recommended heat 1400°F.

Copper to Steel Joints - Silver Solder used without a flux (alloy of 30% silver, 38% copper, 32% zinc). Recommended heat - 1200°F.

S-101 LEAK TESTING (NITROGEN OR NITROGEN-TRACED)

WARNING

To avoid the risk of fire or explosion, never use oxygen, high pressure air or flammable gases for leak testing of a refrigeration system.

WARNING

To avoid possible explosion, the line from the nitrogen cylinder must include a pressure regulator and a pressure relief valve. The pressure relief valve must be set to open at no more than 150 PSIG.

Pressure test the system using dry nitrogen to locate leaks. If you wish to use a leak detector, charge the system to 10 PSIG using the appropriate refrigerant then use nitrogen to finish charging the system to working pressure, then apply the detector to suspect areas. If leaks are found, repair them. After repair, repeat the pressure test. If no leaks exist, proceed to system evacuation.

SERVICING

S-102 EVACUATION

WARNING

REFRIGERANT UNDER PRESSURE!
Failure to follow proper procedures may cause property damage, personal injury or death.

IMPORTANT NOTE: *Because of the potential damage to compressors, do not allow suction pressure at service valve to drop below 5 PSIG when pumping unit system down for repair. Outdoor section, depending on line set length and amount of charge in system, may not be able to hold the entire system charge.*

This is the most important part of the entire service procedure. The life and efficiency of the equipment is dependent upon the thoroughness exercised by the serviceman when evacuating air (non-condensables) and moisture from the system.

Air in a system causes high condensing temperature and pressure, resulting in increased power input and reduced performance.

Moisture chemically reacts with the refrigerant oil to form corrosive acids. These acids attack motor windings and parts, causing breakdown.

The equipment required to thoroughly evacuate the system is a high vacuum pump, capable of producing a vacuum equivalent to 25 microns absolute and a thermocouple vacuum gauge to give a true reading of the vacuum in the system

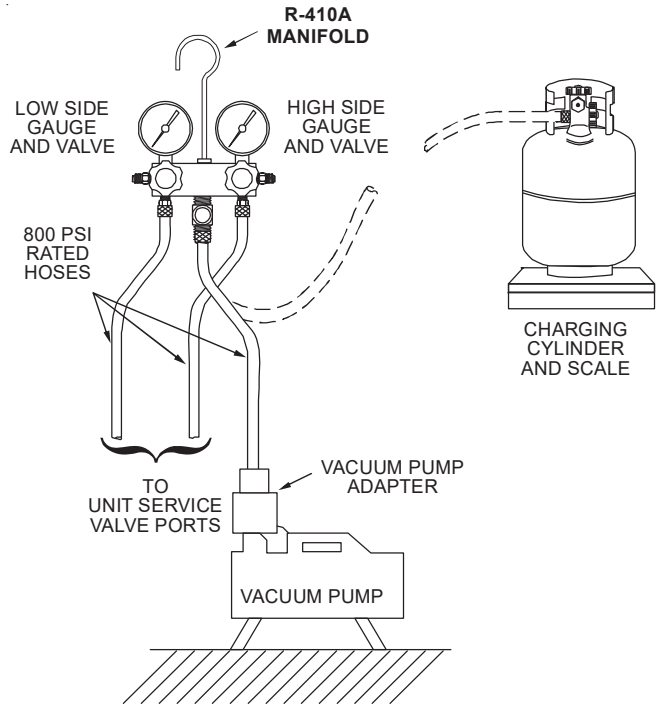
NOTE: Never use the system compressor as a vacuum pump or run when under a high vacuum. Motor damage could occur.

WARNING

Do not front seat the service valve(s) with the compressor open, with the suction line of the compressor closed or severely restricted.

1. Connect the vacuum pump, vacuum tight manifold set with high vacuum hoses, thermocouple vacuum gauge and charging cylinder as shown.

2. Start the vacuum pump and open the shut off valve to the high vacuum gauge manifold only. After the compound gauge (low side) has dropped to approximately 29 inches of vacuum, open the valve to the vacuum thermocouple gauge. See that the vacuum pump will blank-off to a maximum of 25 microns. A high vacuum pump can only produce a good vacuum if its oil is non-contaminated.



EVACUATION

3. If the vacuum pump is working properly, close the valve to the vacuum thermocouple gauge and open the high and low side valves to the high vacuum manifold set. With the valve on the charging cylinder closed, open the manifold valve to the cylinder.

4. Evacuate the system to at least 29 inches gauge before opening valve to thermocouple vacuum gauge.

5. Connect the vacuum pump with 250 micron capability to the service valves.

6. Evacuate the system to 500 microns or less using suction and liquid service valves. Using both valves is necessary.

7. Close pump valve and hold vacuum for 10 minutes. Typically pressure will rise during this period.
   - If the pressure rises to 500 microns or less and remains steady the system is considered leak-free; proceed to start-up.
   - If pressure rises above 500 microns, moisture and/or noncondensibles may be present or the system may have a small leak. Return to step 2: If the same result is encountered, check for leaks as previously indicated and repair as necessary then repeat evacuation.

SERVICING

CAUTION

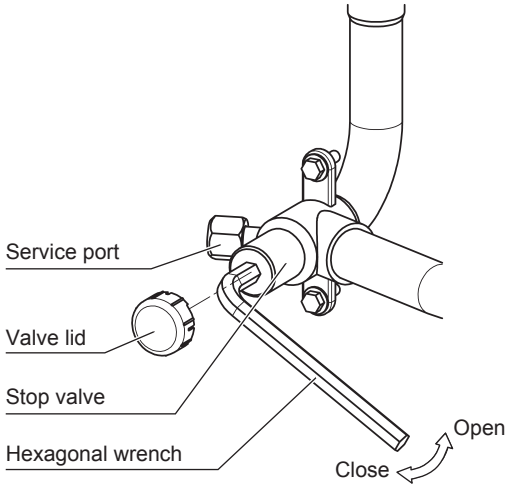
- **BE SURE TO OPEN THE STOP VALVE.**
- **INADEQUATE TORQUE MAY CAUSE LEAKAGE OF REFRIGERANT.**

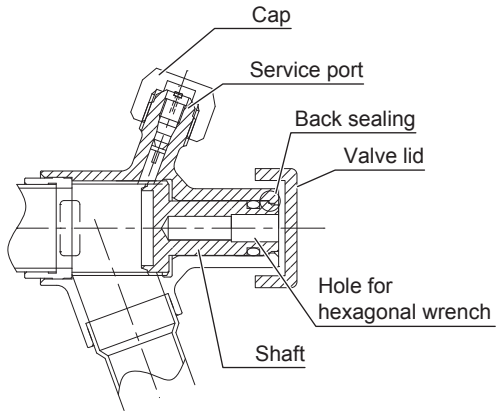
Opening Procedure

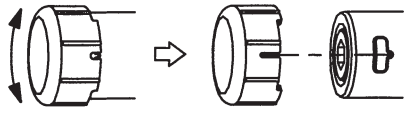
1. Remove the valve lid and use a hexagonal wrench to turn valve counterclockwise.
2. Turn valve until shaft stops, then turn valve until designated torque as shown in below table is achieved (3.5 - 5.0 ton models only).
3. Put valve lid on valve.

Closing Procedure

1. Remove the valve lid and use a hexagonal wrench to turn valve clockwise.
2. Turn valve until shaft stops, then turn valve until designated torque as shown in below table is achieved.
3. Put valve lid on valve.







Rotate the valve lid 90° to the right or to the left.

Align the recess of the valve lid and the T-joint on the valve body, then remove the lid.

* The illustration shows the removal procedure. Perform the actions in the reverse order to reattach.

* The illustrations above refer to 3.5 - 5.0 ton models only.

Tonnage	Piping	Stop valve size	Type	Tightening torque	Wrench size
1.5 - 2.0 ton	Liquid	3/8”	Front sealing type	6 - 8 N·m	3/16”
	Gas	3/4”		19 - 21 N·m	5/16”
2.5 - 3.0 ton	Liquid	3/8”		6 - 8 N·m	3/16”
	Gas	7/8”		19 - 21 N·m	5/16”
3.5 - 5.0 ton	Liquid	3/8”	Front and back sealing type	5 - 7 N·m	4 mm
	Gas	7/8”		19 - 21 N·m	8 mm

SERVICING

S-103 CHARGING

WARNING

REFRIGERANT UNDER PRESSURE!
*** Do not overcharge system with refrigerant.**
*** Do not operate unit in a vacuum or at negative pressure.**
Failure to follow proper procedures may cause property damage, personal injury or death.

CAUTION

Use refrigerant certified to AHRI standards. Used refrigerant may cause compressor damage and is not covered by the warranty. Most portable machines cannot clean used refrigerant to meet AHRI Standards.

CAUTION

Damage to the unit caused by operating the compressor with the suction valve closed is not covered under the warranty and may cause serious compressor damage.

Charge the system with the exact amount of refrigerant.

See the Installation Manual for the correct refrigerant charge.

An inaccurately charged system will cause future problems.

1. When using an ambient compensated calibrated charging cylinder, allow liquid refrigerant only to enter the high side.
2. Once the system stops taking refrigerant, close the valve on the high side of the charging manifold.
3. Start the system and charge the balance of the gas state refrigerant through the low side.

NOTE: R-410A should be drawn out of the storage container or drum in liquid form due to its fractionation properties, but should be "Flashed" to its gas state before entering the system. There are commercially available restriction devices that fit into the system charging hose set to accomplish this. **DO NOT** charge liquid R-410A into the compressor.

4. With the system still running, close the valve on the charging cylinder. At this time, you may still have some liquid refrigerant in the charging cylinder hose and will definitely have liquid in the liquid hose. Reseat the liquid line core. Slowly open the high side manifold valve and transfer the liquid refrigerant from the liquid line hose and charging cylinder hose into the suction service valve port. CAREFUL: Watch so that liquid refrigerant does not enter the compressor.

FINAL CHARGE ADJUSTMENT

The outdoor temperature must be 65°F to 105°F. If outdoor ambient temperature is out of range, charge defined amount and don't adjust subcooling. Set the room thermostat to CHARGE MODE.

After system has stabilized per startup instructions, check subcooling as detailed in the following section.

In the event of system overcharge or undercharge, refrigerant in the system must be adjusted to the appropriate subcooling and superheat as specified in the following sections. Refrigerant amount should be adjusted within +/- 0.5 lb. if the outdoor ambient temperature is greater than 65°F and less than 105°F. Manufacturer recommends that the system should be evacuated and should be charged the initial refrigerant for given line length when the ambient temperature is less than 65°F and more than 105°F. Refer to the Installation Manual to calculate refrigerant amount.

5. With the system still running, remove hose and reinstall both valve caps.
6. Check system for leaks.

NOTE*: Subcooling information is valid only while the unit is operating at 100% capacity or 100% of compressor speed in CHARGE MODE. Compressor speed is displayed under STATUS menu in the thermostat.*

S-104 CHECKING COMPRESSOR EFFICIENCY

The reason for compressor inefficiency is that the compressor is broken or damaged, reducing the ability of the compressor to pump refrigerant vapor.

The condition of the compressor is checked in the following manner.

1. Attach gauges to the high and low side of the system.
2. Start the system and run CHARGE MODE.

If the test shows:

a. Below normal high side pressure.

b. Above normal low side pressure.

c. Low temperature difference across coil.

d. Low amp draw at compressor.

And the charge is correct. The compressor is faulty - replace the compressor.

S-109 CHECKING SUBCOOLING

Refrigerant liquid is considered subcooled when its temperature is lower than the saturation temperature corresponding to its pressure. The degree of subcooling equals the degrees of temperature decrease below the saturation temperature at the existing pressure.

1. Attach an accurate thermometer or preferably a thermocouple type temperature tester to the liquid line as it leaves the condensing unit.
2. Install a high side pressure gauge on the high side (liquid) service valve at the front of the unit.
3. Record the gauge pressure and the temperature of the line.
4. Review the technical information manual or specification sheet for the model being serviced to obtain the design subcooling.
5. Compare the hi-pressure reading to the "Required Liquid Line Temperature" chart (page 79). Find the hi-pressure value on the left column. Follow that line right to the column under the design subcooling value. Where the two intersect is the required liquid line temperature.

   Alternately you can convert the liquid line pressure gauge reading to temperature by finding the gauge reading in the R-410A Pressure vs. Temperature Chart; find the temperature in the °F. Column.
6. The difference between the thermometer reading and pressure to temperature conversion is the amount of subcooling.

ADD CHARGE TO RAISE SUBCOOLING. RECOVER CHARGE TO LOWER SUBCOOLING.

Subcooling Formula = Sat. Liquid Temp. - Liquid Line Temp.

EXAMPLE:

a. Liquid Line Pressure = 417 PSIG
b. Corresponding Temp. = 120°F.
c. Thermometer on Liquid line = 109°F.

To obtain the amount of subcooling subtract 109°F from 120°F.

The difference is 11° subcooling. See the specification sheet or technical information manual for the design subcooling range for your unit.

There are other causes for high head pressure which may be found in the "Cooling Analysis Chart."

If other causes check out normal, an overcharge or a system containing non-condensables would be indicated.

If this system is observed:

1. Start the system.
2. Remove and capture small quantities of gas from the suction line dill valve until the head pressure is reduced to normal.
3. Observe the system while running a cooling performance test. If a shortage of refrigerant is indicated, then the system contains non-condensables.

SUBCOOLING ADJUSTMENT ON EEV APPLICATIONS

NOTE: Subcooling information is valid only while the unit is operating at 100% capacity or 100% compressor speed in CHARGE MODE. Compressor speed is displayed under STATUS menu in the thermostat.

1. Run system at least 20 minutes to allow pressure to stabilize. During the adjustment of subcooling, ambient temperature should be greater than 65°F and less than 105°F. If ambient temperature is out of range, don't adjust subcooling.
2. For best results, temporarily install a thermometer on the liquid line at the liquid line service valve. Ensure the thermometer makes adequate contact and is insulated for best possible readings. Use liquid line temperature to determine subcooling.
3. The system subcooling should fall in the range shown in following table. If not in that range, adjust subcooling according to the following procedure.

   a. If subcooling is low, add charge to adjust the subcooling to the values of the table below.

OD Ambient Temp (degF)	< 65 °F	65°F to 105°F	> 105 °F
Subcooling (degF)	Weigh in Charge	1.5 T - 10 ± 1°F 2.0 T - 12 ± 1°F 2.5 T - 10 ± 1°F 3.0 T - 10 ± 1°F 3.5 T - 8 ± 1°F 4.0 T - 9 ± 1°F 5.0 T - 8 ± 1°F	Weigh in Charge

   b. If subcooling is high, remove charge to lower the subcooling to specified range.

NOTE: Not more than 3/8 lb. (6 oz.) of refrigerant should be added to the system at a time to achieve the target subcooling. It is recommended adding 1 oz. refrigerant each time, then wait 10 minutes to stabilize the system.

4. Disconnect manifold set. Installation is complete.

S-110 CHECKING EXPANSION VALVE OPERATION

1. Remove the remote bulb of the expansion valve from the suction line.
2. Start the system and cool the bulb in a container of ice water, closing the valve. As you cool the bulb, the suction pressure should fall and the suction temperature will rise.
3. Next warm the bulb in your hand. As you warm the bulb, the suction pressure should rise and the suction temperature will fall.
4. If a temperature or pressure change is noticed, the expansion valve is operating. If no change is noticed, the valve is restricted, the power element is faulty, or the equalizer tube is plugged.
5. Capture the charge, replace the valve and drier, evacuate and recharge.

S-114 NON-CONDENSABLES

If non-condensables are suspected, shut down the system and allow the pressures to equalize. Wait at least 15 minutes. Compare the pressure to the temperature of the coldest coil since this is where most of the refrigerant will be. If the pressure indicates a higher temperature than that of the coil temperature, non-condensables are present.

Non-condensables are removed from the system by first removing the refrigerant charge, replacing and/or installing liquid line drier, evacuating and recharging.

S-115 COMPRESSOR BURNOUT

When a compressor burns out, high temperature develops causing the refrigerant, oil and motor insulation to decompose forming acids and sludge.

If a compressor is suspected of being burned-out, attach a refrigerant hose to the liquid line dill valve and properly remove and dispose of the refrigerant.

NOTICE

Violation of EPA regulations may result in fines or other penalties.

Now determine if a burn out has actually occurred. Confirm by analyzing an oil sample using an Oil acid test kit.

Remove the compressor and obtain an oil sample from the suction stub. If the oil is not acidic, either a burnout has not occurred or the burnout is so mild that a complete clean-up is not necessary.

If acid level is unacceptable, the system must be cleaned by using the clean-up drier method.

CAUTION

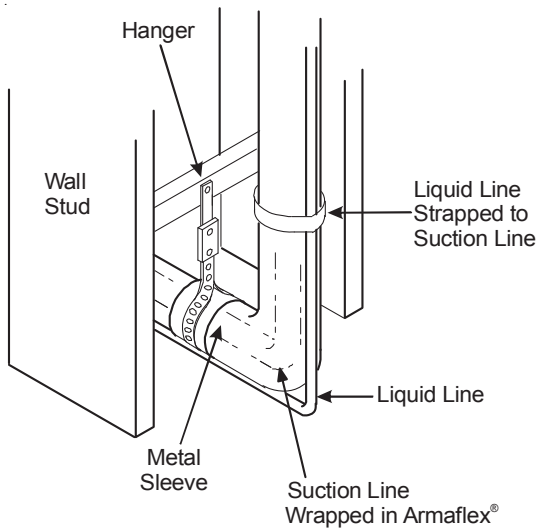
Do not allow the sludge or oil to contact the skin. Severe burns may result.

NOTE: The Flushing Method using R-11 refrigerant is no longer approved by Daikin Brand Heating-Cooling.

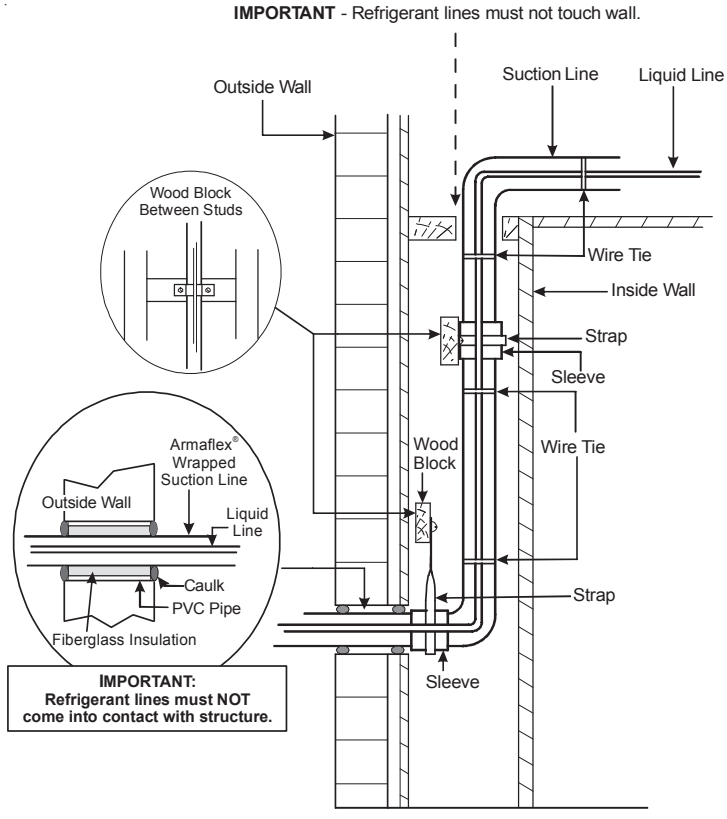
S-120 REFRIGERANT PIPING

The piping of a refrigeration system is very important in relation to system capacity, proper oil return to compressor, pumping rate of compressor and cooling performance of the evaporator. A bi-flow filter drier must be brazed on by the installer onsite. Ensure the bi-flow filter drier paint finish is intact after brazing. If the paint of the steel filter drier has been burned or chipped, repaint or treat with a rust preventative. The recommended location of the filter drier is before the expansion device at the indoor unit. The liquid line must be insulated if more than 50 feet of liquid line will pass through an area that may reach temperatures of 30°F of higher than ambient in cooling mode.

FVC oils maintain a consistent viscosity over a large temperature range which aids in the oil return to the compressor; however, there will be some installations which require oil return traps. These installations should be avoided whenever possible, as adding oil traps to the refrigerant lines also increases the opportunity for debris and moisture to be introduced into the system. Avoid long running traps in horizontal suction line.



Installation of Refrigeration Piping From Vertical to Horizontal

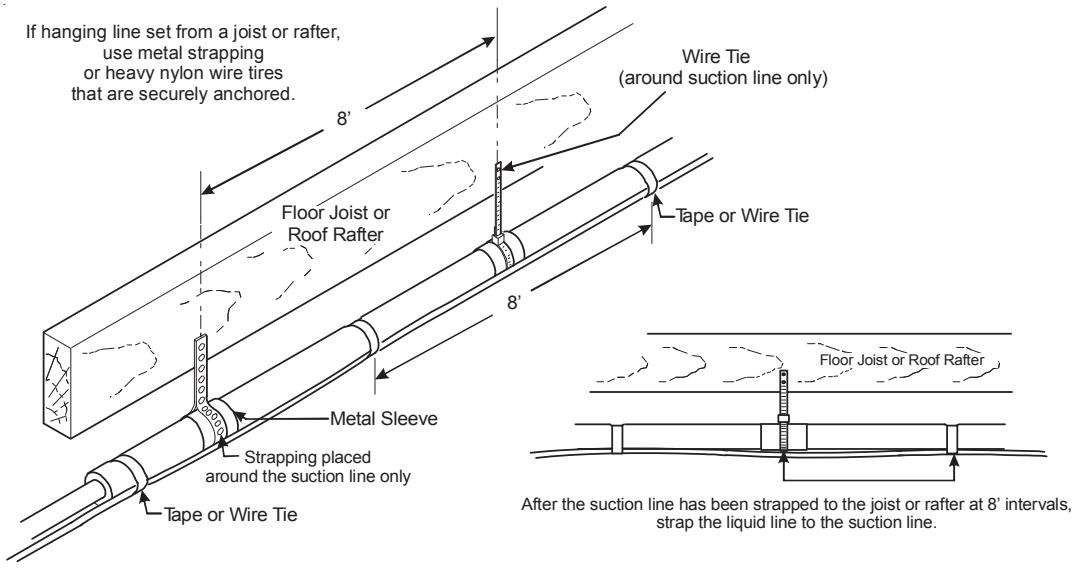


Installation of Refrigerant Piping (Vertical)

New construction shown

NOTE: If line set is installed on the exterior of an outside wall, similar installation practices are to be used.

SERVICING

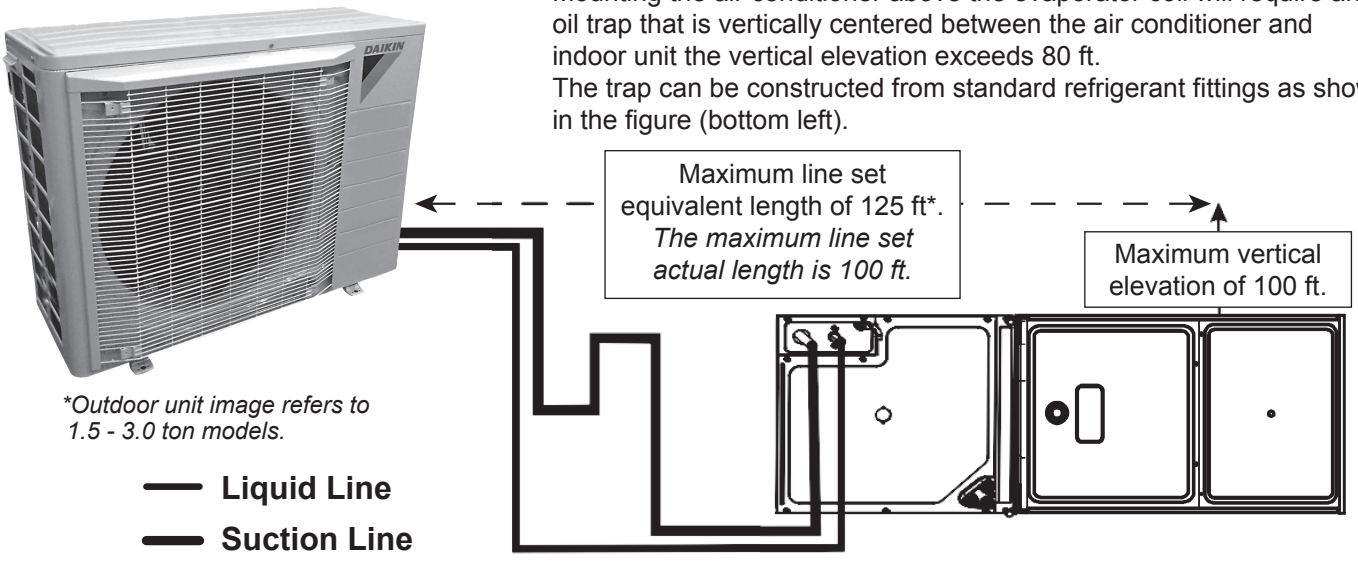


Installation of Refrigerant Piping (Horizontal)

OUTDOOR UNIT IS ABOVE THE INDOOR UNIT

Condenser ABOVE Evaporator

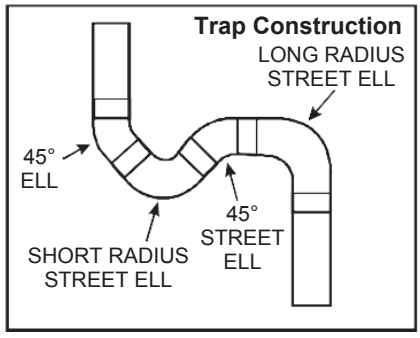
Mounting the air conditioner above the evaporator coil will require an oil trap that is vertically centered between the air conditioner and indoor unit the vertical elevation exceeds 80 ft.
The trap can be constructed from standard refrigerant fittings as shown in the figure (bottom left).



**Includes any elbows, bends, etc.*

1. Suction line must be sloped continuously towards the indoor unit.
2. The maximum elevation (vertical) difference between the outdoor unit and indoor unit is 100 feet.
3. The maximum line set equivalent length is 125 feet, which includes pressure losses of any elbow, bends, etc. The maximum line set actual length is 100 feet.
4. Inverted suction loop is not required at either unit.
5. An accumulator is not required for air conditioners (accumulators are factory installed).

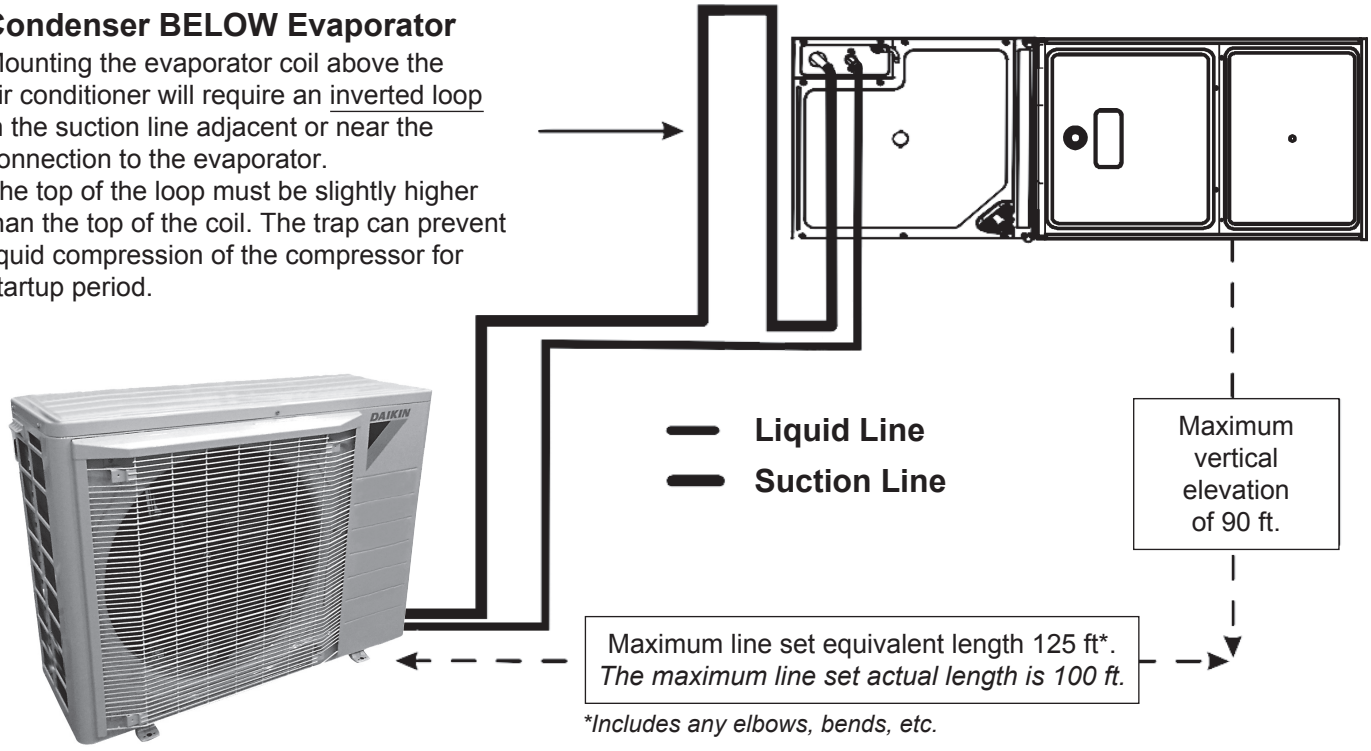
SERVICING



OUTDOOR UNIT IS BELOW THE INDOOR UNIT

Condenser BELOW Evaporator

Mounting the evaporator coil above the air conditioner will require an inverted loop in the suction line adjacent or near the connection to the evaporator.
The top of the loop must be slightly higher than the top of the coil. The trap can prevent liquid compression of the compressor for startup period.



**Outdoor unit image refers to 1.5 - 3.0 ton models.*

1. The maximum elevation (vertical) difference between the outdoor unit and the indoor unit is 90 feet.
2. Suction line must be installed in a manner to prevent liquid migration to the outdoor unit from the indoor unit.

The condenser unit is shipped with a predetermined factory charge level as shown in the following chart. For longer line sets greater than 15 feet, add refrigerant based on installation manual formula.

SERVICING

Calculate Refrigerant Charge Based on Line Set Length

The condenser unit is shipped with a predetermined factory charge level as shown below. For longer line sets greater than 15 ft., or 12 ft. (Detail shown in tables on page 50 and 51) add 0.6 ounce (Liquid line diameter 3/8") or 0.23 ounce (Liquid line diameter 1/4") of refrigerant per foot. Refer to the following page for the equivalent length of the elbow fittings.

Total Refrigerant (A)	=	**Factory Charge (B)**	+	**Additional Charge (C) [For liquid Line (C)-1] – [Adjust amount from suction line (C)-2]**

(A) to (C) parameters are calculated/followed below.

(A) There is 2 way calculation for total refrigerant amount

(A)-1 Select line set length from (A)-1 table.

(A)-2 Calculate from above formula by using (B), (C)-1 and (C)-2 factors.

(B) Pick up from name plate which has factory charge amount.

(C) Calculate above formula. (C)-1 and (C)-2 shown below.

Subtract factory charge length (see (A)-1 Table) from the overall length and put the results in [___] ft

Additional Charge for liquid line (C)-1	=	(in case of 3/8" liquid line) [___] ft. × 0.6 oz. (in case of 1/4" liquid line) [___] ft. × 0.23 oz.
Adjust amount from suction line (C)-2	=	Check the suction line diameter and pick the adjust amount (oz.)

SERVICING

The following table shows refrigerant amount for every 5 feet of line.

Charge Table for Total/Additional Refrigerant (A)-1 CAPE(A) Connection for DX17VSS181/241/301/361AA

Actual Line Set Length (ft.)	Unit Tonnage									
	1.5 ton				2.0 ton		2.5 ton		3.0 ton	
	Total/Additional refrigerant (oz.)									
Indoor Coil	CAPE(A)									
Liquid Line Diameter (inch)	1/4”		3/8”		3/8”		3/8”		3/8”	
Suction Line Diameter (inch)	3/4”				3/4”		7/8”		7/8”	
Total/Additional	Total	Additional	Total	Additional	Total	Additional	Total	Additional	Total	Additional
15	n/a		**76**	**0**	**76**	**0**	**79**	**0**	**85**	**0**
20			79	3	79	3	82	3	88	3
25	**76**	**0**	82	6	82	6	85	6	91	6
30	77	1	85	9	85	9	88	9	94	9
35	78	2	88	12	88	12	91	12	97	12
40	79	3	91	15	91	15	94	15	100	15
45	81	5	94	18	94	18	97	18	103	18
50	82	6	97	21	97	21	100	21	106	21
55	83	7	100	24	100	24	103	24	109	24
60	84	8	103	27	103	27	106	27	112	27
65	85	9	106	30	106	30	109	30	115	30
70	86	10	109	33	109	33	112	33	118	33
75	88	12	112	36	112	36	115	36	121	36
80	89	13	115	39	115	39	118	39	124	39
85	90	14	118	42	118	42	121	42	127	42
90	91	15	121	45	121	45	124	45	130	45
95	92	16	124	48	124	48	127	48	133	48
100	93	17	127	51	127	51	130	51	136	51

Factory Charge

Charge Table for Total/Additional Refrigerant (A)-1 CHPE Connection for DX17VSS181/241/301/361AA

Actual Line Set Length (ft.)	Unit Tonnage									
	1.5 ton				2.0 ton		2.5 ton		3.0 ton	
	Total/Additional refrigerant (oz.)									
Indoor Coil	CHPE									
Liquid Line Diameter (inch)	1/4”		3/8”		3/8”		3/8”		3/8”	
Suction Line Diameter (inch)	3/4”				3/4”		7/8”		7/8”	
Total/Additional	Total	Additional	Total	Additional	Total	Additional	Total	Additional	Total	Additional
12	n/a		**76**	**0**	**76**	**0**	**79**	**0**	**85**	**0**
15			78	2	78	2	81	2	87	2
20	**76**	**0**	81	5	81	5	84	5	90	5
25	77	1	84	8	84	8	87	8	93	8
30	78	2	87	11	87	11	90	11	96	11
35	79	3	90	14	90	14	93	14	99	14
40	81	5	93	17	93	17	96	17	102	17
45	82	6	96	20	96	20	99	20	105	20
50	83	7	99	23	99	23	102	23	108	23
55	84	8	102	26	102	26	105	26	111	26
60	85	9	105	29	105	29	108	29	114	29
65	86	10	108	32	108	32	111	32	117	32
70	88	12	111	35	111	35	114	35	120	35
75	89	13	114	38	114	38	117	38	123	38
80	90	14	117	41	117	41	120	41	126	41
85	91	15	120	44	120	44	123	44	129	44
90	92	16	123	47	123	47	126	47	132	47
95	93	17	126	50	126	50	129	50	135	50
100	94	18	129	53	129	53	132	53	138	53

Factory Charge

SERVICING

Charge Table for Total/Additional Refrigerant (A)-1 for DX17VSS421/481/601AA

Actual Line Set Length (ft.)	3.5/4.0 ton		5.0 ton	
	Total refrigerant (oz.)			
Liquid Line Diameter (inch)	3/8”			
Suction Line Diameter (inch)	1 1/8”			
Total/Additional	Total	Additional	Total	Additional
15	**116**	**0**	**139**	**0**
20	119	3	142	3
25	122	6	145	6
30	125	9	148	9
35	128	12	151	12
40	131	15	154	15
45	134	18	157	18
50	137	21	160	21
55	140	24	163	24
60	143	27	166	27
65	146	30	169	30
70	149	33	172	33
75	152	36	175	36
80	155	39	178	39
85	158	42	181	42
90	161	45	184	45
95	164	48	187	48
100	167	51	190	51

Factory Charge

Charge Table for Adjusting Charge from Suction Pipe Size (C)-2

Actual Line Set Length (ft.)	Unit Tonnage					
	1.5 - 2.0 Ton		2.5 - 3.0 Ton		3.5 - 5.0 Ton	
	Adjust refrigerant (oz.)					
Suction Line Diameter (inch)	**5/8”**	**3/4”**	**3/4”**	**7/8”**	**7/8”**	**1 1/8”**
12 - 15	1	-	1	-	2	-
20 - 25	2	-	2	-	4	-
30 - 40	3	-	3	-	6	-
40 - 50	4	-	4	-	9	-
50 - 60	5	-	5	-	11	-
60 - 70	5	-	6	-	12	-
70 - 80	6	-	7	-	14	-
80 - 90	7	-	8	-	16	-
90 - 100	8	-	9	-	18	-

SERVICING

S-202 DUCT STATIC PRESSURES AND/OR STATIC PRESSURE DROP ACROSS COILS

This minimum and maximum allowable duct static pressure for the indoor sections are found in the specifications section.

Tables are also provided for each coil, listing quantity of air (CFM) versus static pressure drop across the coil.

Too great an external static pressure will result in insufficient air that can cause icing of the coil. Too much air can cause poor humidity control and condensate to be pulled off the evaporator coil causing condensate leakage. Too much air can also cause motor overloading and in many cases this constitutes a poorly designed system.

S-203 TWO PIECE INDOOR UNIT EXTERNAL STATIC

Two piece indoor unit refers to CAPE(A)/CHPE cased coil with Gas Furnace/Modular Blower.

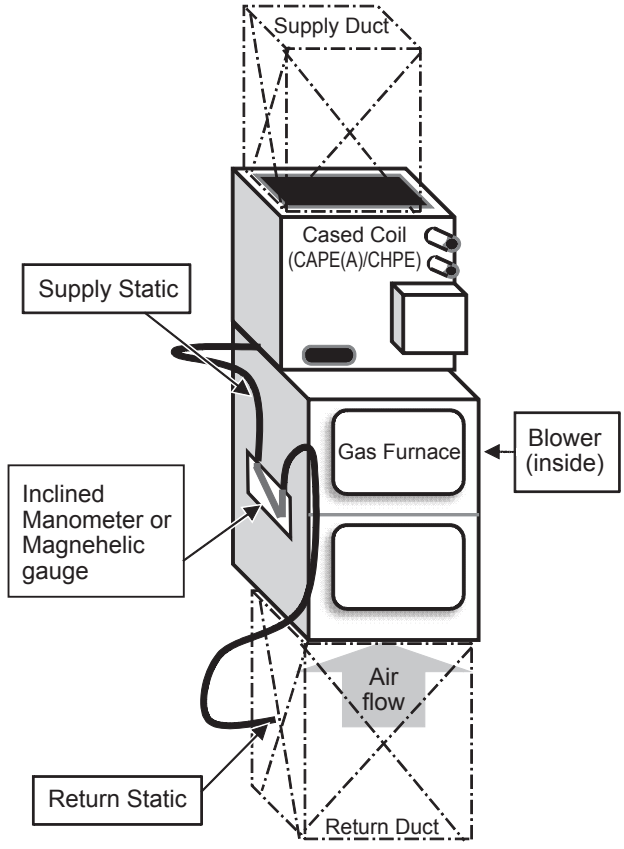
To determine proper air movement, proceed as follows:

1. With clean filters in the indoor unit, use a draft gauge (inclined Manometer or Magnehelic gauge) to measure the static pressure of the return duct at the inlet of the Gas Furnace or Modular Blower, this will be a negative pressure (for example, -0.30"wc).
2. Measure the static pressure of the supply duct at the outlet of the Gas Furnace or Modular Blower, this should be a positive pressure (for example, 0.20"wc).
3. Add the two (2) readings together for total absolute value of external static pressure (for example, -0.30"wc + 0.20"wc = 0.50"wc total static pressure).

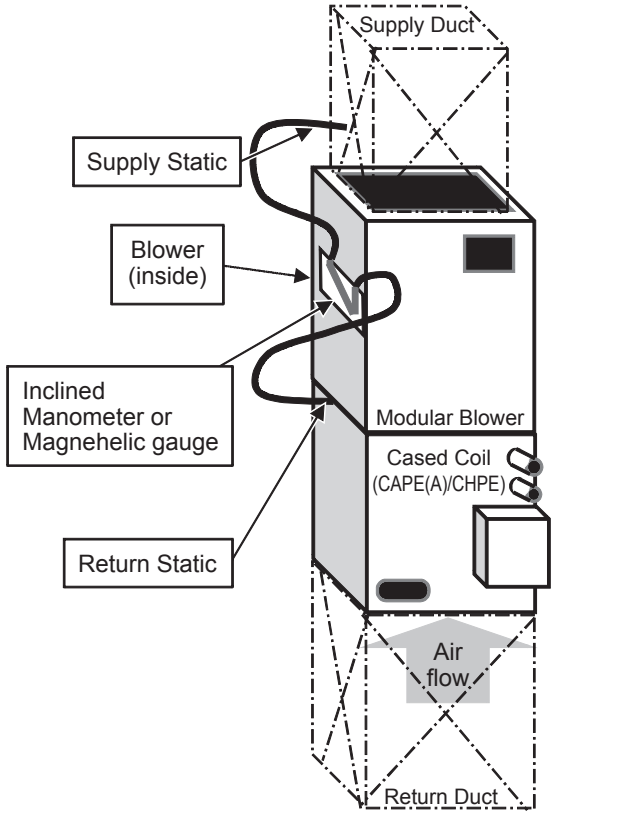
NOTE: Both readings may be taken simultaneously and read directly on the manometer if so desired.
If an Electronic Air Cleaner is used in conjunction with the indoor unit, the readings must also include these components.

4. Consult proper Gas Furnace or Modular Blower airflow chart for quantity of air (CFM) at the measured external static pressure.

If the total external static pressure exceeds the minimum or maximum allowable statics, check for closed dampers, registers, undersized and/or oversized poorly laid out duct work.



Case of Cased Coil + Gas Furnace



Case of Cased Coil + Modular Blower

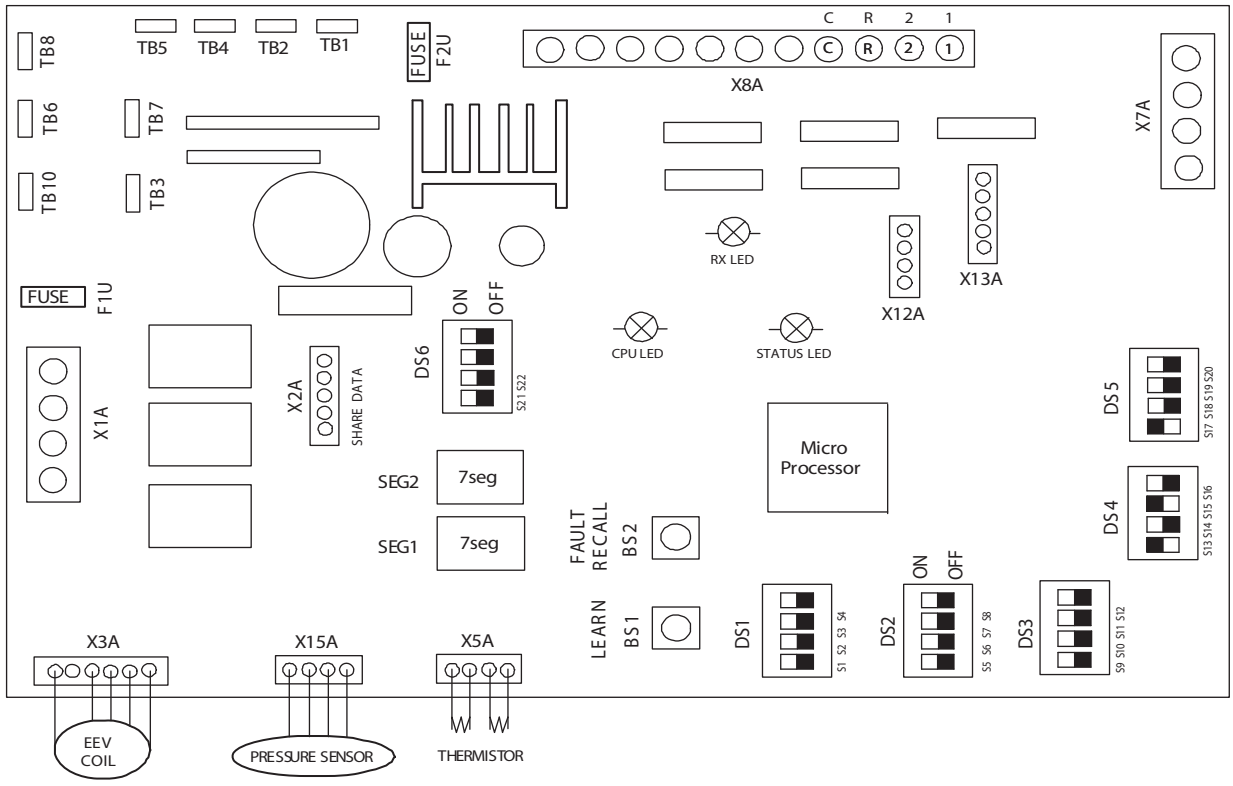
SERVICING

TROUBLESHOOTING-INDOOR UNIT FOR CAPE(A)/CHPE**

⚠ WARNING

HIGH VOLTAGE !

DISCONNECT ALL POWER BEFORE SERVICING.
MULTIPLE POWER SOURCES MAY BE PRESENT. FAILURE TO DO SO MAY CAUSE PROPERTY DAMAGE, PERSONAL INJURY OR DEATH.



CASED COIL (CAPE(A)*/CHPE*) PCB

TROUBLESHOOTING

ELECTROSTATIC DISCHARGE (ESD) PRECAUTIONS

NOTE: Discharge body's static electricity before touching unit. Electrostatics can adversely affect electrical components.

Use the following precautions during indoor unit installation and servicing to protect the integrated control module from damage. By putting the indoor unit, the control, and the person at the same electrostatic potential, these steps will help avoid exposing the integrated control module to electrostatic discharge. This procedure is applicable to both installed and uninstalled (ungrounded) indoor units.

1. Disconnect all power to the indoor unit. Do not touch the integrated control module or any wire connected to the control prior to discharging your body's electrostatic charge to ground.
2. Firmly touch a clean, unpainted, metal surface of the indoor unit blower near the control. Any tools held in a person's hand during grounding will be discharged.
3. Service integrated control module or connecting wiring following the discharge process in step 2. Use caution not to recharge your body with static electricity; (i.e., do not move or shuffle your feet, do not touch ungrounded objects, etc.). If you come in contact with an ungrounded object, repeat step 2 before touching control or wires.
4. Discharge your body to ground before removing a new control from its container. Follow steps 1 through 3 if installing the control on an indoor unit. Return any old or new controls to their containers before touching any ungrounded object.

SERVICING

NETWORK

The ComfortNet system is a fully communicating system, constituting a network. Occasionally the need to troubleshoot the network may arise.

The integrated cased coil control has some onboard tools:

red communications LED, green receive (Rx) LED, and the learn button.

Refer to the Communications Troubleshooting Chart on the following table for error codes, possible causes and corrective actions.

- Red communications LED - Indicates the status of the network.
  The Communications Troubleshooting Chart on the following table indicates the LED status and the corresponding potential problem.
- Green receive LED - Indicates network traffic.
  The following table indicates the LED status and the corresponding potential problem.
- Learn button - Used to reset the network.
  Depress the button and hold for more than 5 seconds to reset the network.

Voltages between the two data lines, and between each data line and common may be used to determine if the network is operating properly. Do the following to measure the voltages on the communications data lines.

⚠ WARNING

LINE VOLTAGE NOW PRESENT.

1. With power ON to the unit, measure voltage between terminal "1" and terminal "C" on control board's thermostat connector. Voltage should be as noted in the table below.
2. Measure voltage between terminals "2" and "C".
3. Measure voltage between terminals "1" and "2".
4. If voltages are different than stated in the table below, check thermostat wiring for opens/shorts. Confirm that the BIAS and TERM dip switches are in the ON position.
5. The Communications Troubleshooting Chart on the next page provides additional communications troubleshooting information.

Terminals	Nominal DC Voltages
1 to C	> 2.5 VDC
2 to C	< 2.5 VDC
1 to 2	> 0.2 VDC

SERVICING

NETWORK

LED	LED Status	Indication	Possible Causes	Corrective Action(s)	Notes & Cautions
Red Communications LED	Off	• None	• None	• None	• None
	1 Flash	• Communications Failure	• Communications Failure	• Depress Learn Button • Verify wiring connection	• Depress once quickly for a power-up reset • Depress and hold for 5 seconds for an out-of-box reset
	2 Flashes	• Out-of-box reset	• Control power up • Learn button depressed	• None	• None
Green Receive LED	Off	• No power • Communications error	• No power to cased coil • Open fuse • Communications error	• Check fuses and circuit breakers; replace/reset • Replace blown fuse • Check for shorts in low voltage wiring in cased coil/system • Reset network by depressing learn button • Check data 1/data 2 voltages	• Turn power OFF prior to repair
	1 Steady Flash	• No network found	• Broken/disconnected data wire(s) • Cased coil is installed as a non-communicating/ traditional system	• Check communications wiring (data 1/data 2 wires) • Check wire connections at terminal block • Verify cased coil installation type (non-communicating/ traditional or communicating) • Check data 1/data 2 voltages	• Turn power OFF prior to repair • Verify wires at terminal blocks are securely twisted together prior to inserting into terminal block • Verify data 1 and data voltages as described above
	Rapid Flashing	• Normal network traffic	• Control is "talking" on network as expected	• None	• None
	On Solid	• Data 1/Data 2 miss-wire	• Data 1/data 2 wires reversed at cased coil, thermostat, or ComfortNet™ compatible outdoor AC • Short between data 1/ data 2 wires • Short between data 1 or data 2 wires and R (24VAC) or C (24VAC common)	• Check communications wiring (data 1/data 2 wires) • Check wire connections at terminal block • Check data 1/data 2 voltages	• Turn power OFF prior to repair • Verify wires at terminal blocks are securely twisted together prior to inserting into terminal block • Verify data 1 and data voltages as described above

COMMUNICATIONS TROUBLESHOOTING CHART

SERVICING

SETTING THE MODE DISPLAY (CAPE(A)/CHPE*)*

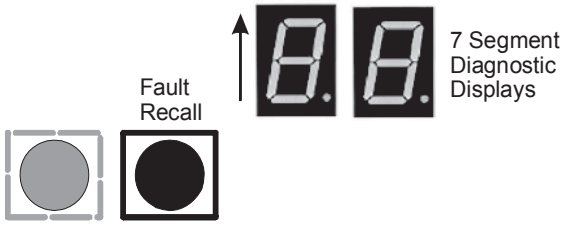
Diagnostic Chart

WARNING

HIGH VOLTAGE!

To avoid personal injury or death due to electrical shock, disconnect electrical power before performing any service or maintenance.

Refer to the indoor unit *Troubleshooting Chart* at the later page for assistance in determining the source of unit operational problems. The 7 segment LED display will provide any active fault codes. The arrow in the illustration below indicates the orientation of the display (arrow points to top of display). See following image.



Servicing

NOTE: The active fault codes displayed on this PCB are information related only to CAPE(A)* / CHPE*.
The active fault codes of gas furnaces and modular blowers are displayed on the PCB installed in each unit.
When trouble of the indoor unit occurs, check the active fault codes on PCB of each unit.
Please refer to the Service Manual of each unit about the Troubleshooting Gas Furnace and Modular Blower.

Fault Recall

The integrated control module is equipped with a momentary push-button switch that can be used to display the last six faults on the 7 segment LED display. To display the faults, follow the steps below.

NOTE: The integrated control module must be in Standby Mode (no thermostat inputs).

1. Press FAULT RECALL button (for 2 to 5 seconds). The 7 segment LED display will show solid "--".

NOTE: If FAULT RECALL button is not pressed long enough (for 2 to 5 seconds), the control goes back to Standby Mode.

2. Release the FAULT RECALL button. The 7 segment LED display will show the most recent fault.
3. Subsequent pressing of the FAULT RECALL button will recall a previous fault. At the end of the faults, the 7 segment LED display will show "--" and go back to Standby Mode.

NOTE: Consecutively repeated faults are displayed a maximum of three times. If the FAULT RECALL button is left untouched longer than 3 minutes, the control goes back to Standby Mode.

To clear the error code history:

1. Press FAULT RECALL button until the 7 segment LED display blinks "--".
2. Release the FAULT RECALL button. The 7 segment LED display will show "88" and clear the faults.

NOTE: If FAULT RECALL button is pressed for longer than 15 seconds, control goes back to Standby Mode.

DIAGNOSTIC CODES (CAPE(A)/CHPE*)*

7 SEGMENT LED CODES

7 SEGMENT LED DISPLAY	DESCRIPTION OF CONDITION	ERROR MESSAGE
On	Normal Operation	--
EE	EMERGENCY MODE	--
d0	DATA NOT ON NETWORK	Data Not Yet On Network
d4	INVALID MEMORY CARD DATA	Invalid Memory Card data
70	EEV DISCONNECTION DETECTED	EEV OPEN CKT
73	LIQUID SIDE THERMISTOR ABNORMALITY	LIQ TEMP FLT
74	GAS SIDE THERMISTOR ABNORMALITY	GAS TEMP FLT
75	PRESSURE SENSOR ABNORMALITY	PRESSURE FLT
76	CASED COIL - OUTDOOR UNIT, GAS FURNACE OR BLOWER UNIT COMMUNICATION ERROR (DURING OPERATION)	EQUIP COMM LOSS
77	CASED COIL - THERMOSTAT COMMUNICATION ERROR (STARTUP OPERATION & DURING OPERATION)	TSTAT ID NO COM
78	CASED COIL - OUTDOOR UNIT, GAS FURNACE OR BLOWER UNIT COMMUNICATION ERROR (STARTUP OPERATION)	CONNECT EQUIP

SERVICING

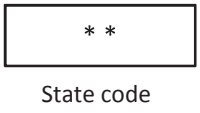
2-DIGIT 7 SEGMENT DISPLAYS (CAPE(A)/CHPE*)*



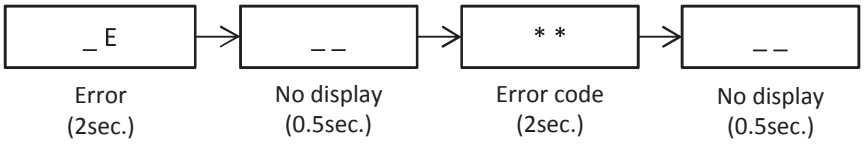
7 Segment LED Display (State)	Description of Condition
(No Display)	INTERNAL CONTROL FAULT / NO POWER
On	STATE OF NORMAL ENERGIZATION EXCLUDING EMERGENCY MODE
EE	EMERGENCY MODE

When the indoor unit is energized power supply, 2-digit 7 segment displays on CAPE(A)*/CHPE* PCB show current status of state and error code.

1. State shows current operation status of indoor unit described in above table.

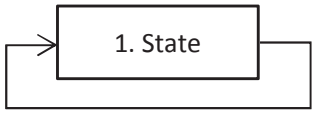


2. Error code shows current error cased coil has. To see the previous error code, please follow the instruction of fault recall. For more information of error code, please see the table of cased coil error code.

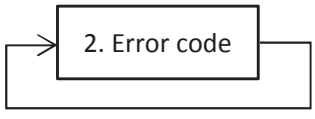


The contents indicated at 7 segment display vary from operation mode and status of cased coil. In the event of showing some error code, please follow the instruction in the table of cased coil error code to solve the error.

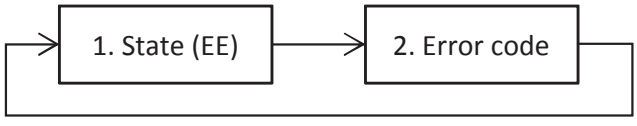
1. When the unit is running, 2-digit 7 segment displays keep showing state.



2. When the unit is having some major and minor error code, 2-digit 7 segment displays keep showing error code.



3. When the unit is having some minor error code during Emergency mode, 2-digit 7 segment display shows state “EE” and error code.



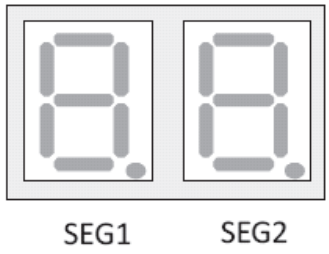
SETTING THE MODE DISPLAY (CAPE(A)/CHPE*)*

MODE DISPLAY INTRODUCTION

A 2-digit display is provided on the printed circuit board (PCB) as a backup tool to the thermostat for accessing error codes and erasing error code history of the cased coil. Follow the information provided in this section to learn how to use the mode display.

DISPLAY

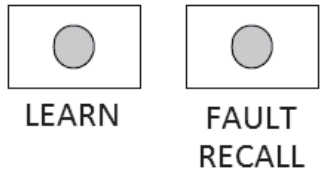
The display consists of 2 digits.





DISPLAY BUTTON LAYOUT

The display buttons shown can be used to navigate and select items:



Example of button layout is shown above

FAULT CODE HISTORY NAVIGATION

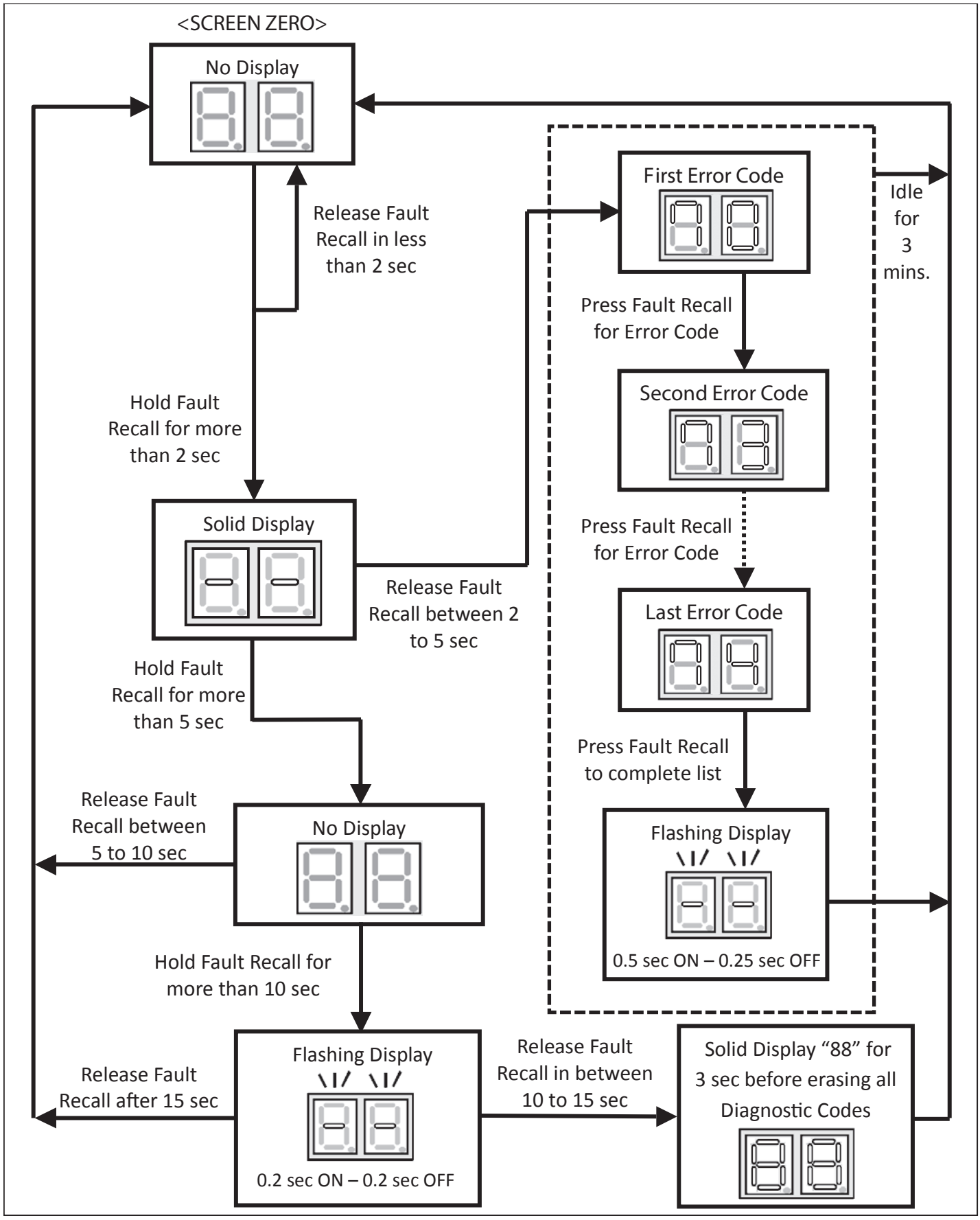
This mode will allow the user to see the six most recent cased coil faults. Please follow the flowchart to navigate to error codes from screen zero.

For a list of the fault codes, please see the TROUBLESHOOTING tables in this document.

It is also possible to erase all the diagnostics codes from this menu.

SERVICING

SETTING THE MODE DISPLAY (CAPE(A)*/CHPE*)



INDOOR UNIT ERROR CODES (CAPE(A)/CHPE*)*

TROUBLESHOOTING

Error Code	PCB LED Display	ClimateTalk Message	Description	Possible Causes	Corrective Actions
EE	No display*1	INTERNAL FAULT	• No 24 volt power to PCB • Blown fuse or circuit breaker • PCB has an internal fault	• Manual disconnect switch OFF • No 24 volt power to PCB • Blown fuse or faulty circuit breaker • PCB has internal fault	• Assure 24 volt power to blower and PCB • Check fuse F2U on PCB • Check for possible short in 115/208/230 volt and 24 volt circuits; Repair as necessary • Replace the PCB
d0	E_d0	Data Not Yet On Network (NO NET DATA)	Data not on Network	• No shared data on the network	• Populate shared data set using memory card.
d4	E_d4	Invalid Memory Card data (INVALID MC DATA)	Invalid Memory Card Data	• Wrong memory card data	• Replace circuit board • Rewrite data using the correct memory card
70	E_70	EEV OPEN CKT	EEV disconnection detected	• Indoor EEV coil not connected • Incorrect wiring to EEV	• Check Indoor EEV coil connection (PCB and junction connector) • Replace EEV coil • Check the resistance value of EEV coil • Replace the PCB
73	E_73	LIQ TEMP FLT	Liquid side thermistor abnormality	• Open (or) short circuit of the liquid thermistor (X5A) • Liquid thermistor reading incorrect or values outside the normal range	• Check the connection to liquid thermistor (PCB and junction connector) • Check the resistance value of the thermistor • Replace thermistor • Replace the PCB
74	E_74	GAS TEMP FLT	Gas side thermistor abnormality	• Open (or) short circuit of the gas thermistor (X5A) • Gas thermistor reading incorrect or values outside the normal range	• Check the connection to gas thermistor (PCB and junction connector) • Check the resistance value of the thermistor • Replace thermistor • Replace the PCB
75	E_75	PRESSURE FLT	Pressure sensor abnormality	• Open (or) short circuit of the pressure sensor (X15A) • Pressure sensor reading incorrect or values outside the normal range	• Check the connection to pressure sensor (PCB and junction connector) • Check the output voltage of the pressure sensor • Replace pressure sensor • Replace the PCB
76	E_76	EQUIP COMM LOSS	Cased coil - Outdoor unit, Gas furnace or Blower unit communication error (during operation)	• Open communication circuit • Incorrect wiring between OD unit, Gas Furnace or Modular Blower • No power supply to OD unit, Gas Furnace or Modular Blower	• Check for cased coil and other unit wiring. • Replace the PCB • Check power supply to OD unit, Gas Furnace or Modular Blower
77	E_77	TSTAT ID NO COM	Cased coil - Thermostat communication error (startup operation & during operation)	• Incorrect wiring between ID unit and thermostat. *The system may have the communication error without error code 77 on the indoor PCB.* • Thermostat failure • Power interruption (low voltage)	• Check for thermostat and indoor unit wiring • Verify the input voltage at the ID unit and thermostat *After recovering the system with power supply, TSTAT ID NO COM will continue to be displayed on the thermostat within 2 minutes.* *The error code will be cleared automatically.* • Replace the PCB or thermostat • Press "LEARN" button on PCB for more than 5 seconds to reestablish network
78	E_78	CONNECT EQUIP	Cased coil - Outdoor unit, Gas furnace or Blower unit communication error (Startup operation)	• Open communication circuit • Incorrect wiring between OD unit, Gas Furnace or Modular Blower • No power supply to OD unit, Gas Furnace or Modular Blower	• Check for cased coil and other unit wiring. • Replace the PCB • Check power supply to OD unit, Gas Furnace or Modular Blower

*1 When “EE” is displayed on the LED display, it indicates the state of Emergency mode.

SERVICING

Air Conditioner Advanced Feature Menu

DIAGNOSTICS		
SUBMENU ITEM	***INDICATION/USER MODIFIABLE OPTIONS***	***COMMENTS***
Clear Faults	NO or YES	Selecting “YES” clears the fault history.
Fault 1	Most recent AC fault	
Fault 2	2nd most recent AC fault	
Fault 3	3rd most recent AC fault	
Fault 4	4th most recent AC fault	
Fault 5	5th most recent AC fault	
Fault 6	6th most recent AC fault	

STATUS	
SUBMENU ITEM	***COMMENTS***
Time Stamp (TS)	Provides compressor run time in hours.
Mode (MD)	Current system operation mode (COOLING, COOLING STARTUP, OIL RETURN, STOP).
Compressor Reduction Mode (CRM)	Displays ON or OFF status. ON indicates that the reduction mode is operating and the compressor is running at a lower speed than the cooling load would normally require.
Requested and Actual % Demand (RAD)	Displays a 0-100% value, based on a ratio of the requested cooling demand to what the system is actually providing.
Requested and Reported ID CFM (RAF)	Compares the indoor airflow to what the indoor equipment has reported.
Outdoor Air Temperature and Outdoor Fan RPM (ATOF)	Displays the outdoor air temperature as well as the outdoor fan speed (RPM).
Discharge Temperature and Outdoor Coil Temperature (DCT)	Displays the discharge temperature and outdoor coil temperature sensor readings.
Outdoor Liquid Temperature (DLT)	Displays the outdoor liquid temperature sensor reading.
Pressure Sensor and Suction Temperature (PSDST)	Displays the pressure sensor reading which is taken slightly upstream of the suction accumulator and outdoor suction temperature sensor reading.

SYSTEM SETUP (SYS SETUP1 and SYS SETUP2)		
SUBMENU ITEM	***USER MODIFIABLE OPTIONS***	***COMMENTS***
Reset System Setup Options to Factory Defaults (SYS SETUP RESET)	NO or YES	Selecting “YES” resets this menu to factory default settings
SET MAX CURRENT	N/A	Future use.
VERTICAL RISE	Same Level, Outdoor Lower, or Indoor Lower	If the outdoor & indoor units are within +/- 15 ft. vertical distance, select “SAME LEVEL”. If the outdoor unit is more than 15 ft. below the indoor unit, select “OUTDOOR LOWER”. If the outdoor unit is more than 15 ft. above the indoor unit, select “INDOOR LOWER”.
BOOST MODE (“BOOST MD”)	ON or OFF	“BOOST MD” turns BOOST MODE OFF or ON. BOOST MODE is ON by default. See BOOST MODE section of this manual for more details.
BOOST MODE TEMPERATURE (BOOST TEMP)	Always ON, 70, 75, 80, 85, 90, 95, 100, 105°F	BOOST TEMP adjusts the activation temperature from 70°F to 105°F. An “Always ON” option is also available to permanently engage BOOST MODE.
NIGHT MODE (NIGHT MD) (In case of CTK04)	ON or OFF	NIGHT MODE is OFF by default. See NIGHT MODE section of this manual for more details.
NOISE DOWN LEVEL	1, 2, or 3	NOISE DOWN LEVEL adjusts the noise level. 3 is the most quiet level.
NIGHT MODE START (In case of CTK04)	-2Hour, -1Hour, Standard, +1Hour, +2Hour	NIGHT MODE START adjusts the time to start for NIGHT MODE.
NIGHT MODE END (In case of CTK04)	-2Hour, -1Hour, Standard, +1Hour, +2Hour	NIGHT MODE END adjusts the time to end for NIGHT MODE.
CAPACITY PRIORITY (CAP PRIORITY)	ON or OFF	CAP PRIORITY is ON by default. If during operation the capacity demand is high, then the night mode function will be temporarily overridden by the cap priority function to return the room temperature to the set point.
CHARGE MODE	ON or OFF	Enter Charging Mode. This allows for a steady system operation for a duration of approximately 1 hour to allow for refrigerant charging of the system via the suction charge port. The system will stop after completion.

EQUIPMENT TEST (EQUIP TEST)		
SUBMENU ITEM	***INDICATION/USER MODIFIABLE OPTIONS***	***COMMENTS***
System Verification Test (SYSTEM TEST)	ON or OFF	System Verification Test must be run after installation. This is approximately a 10-15 minute test. If the thermostat is set to COOL mode, the system will enter CHARGE mode upon completion, otherwise it will stop.

COOL SETUP		
SUBMENU ITEM	***USER MODIFIABLE OPTIONS***	***COMMENTS***
CL Reset	YES or NO	Selecting to default factory setting.
Cool Airflow Trim Hi*	-15% to +15% in 3% increments	Selects the cooling airflow trim amount.
Cool Airflow Trim Int	-15% to +15% in 3% increments	Selects the cooling airflow trim amount.
Cool Airflow Trim Low	-15% to +15% in 3% increments	Selects the cooling airflow trim amount.
Cool Airflow Profile	A, B, C, or D	Selects the cooling airflow profile.
Cool ON Delay	5, 10, 20, 30 seconds	Selects the indoor blower ON delay.
Cool OFF Delay	30, 60, 90, 120 seconds	Selects the indoor blower OFF delay.
Dehumidification Select	ON or OFF	Selecting “OFF” disables dehumidification; selecting “ON” enables dehumidification.

SET COOLING RUN VALUES (CL RUN VALUES)		
SUBMENU ITEM	***USER MODIFIABLE OPTIONS***	***COMMENTS***
Maximum Compressor RPS Range for Cooling (COOL RPS RANGE)	Five different compressor RPS ranges will be provided.	Select the appropriate range for the installed system configuration.
Maximum Compressor RPS Selection for Cooling (COOL RPS SELECT)	10 compressor RPS values will be provided within the range selected in the COOL RPS RANGE menu.	Select the appropriate compressor RPS for the installed system configuration.

* *3.0 ton with D*80VC0603B/0803B, D*80VC0804C and MBVC1200 combination trim +12% and +15% settings are invalid. Trimmed up CFM makes miss matching error.*
3.0 ton with CAPEA3026B4 downflow and CAPEA3026C4 downflow combination trim do not setting positive. (–15% ≤ Trim ≤ 0%)
*5.0 ton with D*96VC0804C, D*97MC0804C and DM80VC0804C combination trim +9%, +12% and +15% settings are invalid. Trimmed up CFM makes miss matching error.*
3.5 ton with CHPE3743C4 combination trim setting up to +6% only. (–15% ≤ Trim ≤ +6%)

SERVICING

EMERGENCY MODE FOR EEV APPLICABLE INDOOR UNIT

WARNING

HIGH VOLTAGE!
DISCONNECT ALL POWER BEFORE SERVICING. MULTIPLE POWER SOURCES MAY BE PRESENT. FAILURE TO DO SO MAY CAUSE PROPERTY DAMAGE, PERSONAL INJURY OR DEATH.



Emergency mode is to only be used in a situation where communication between equipment (broken wires) or a failed thermostat cannot be immediately corrected or replaced. This mode will allow for cooling or heating to be activated without the need of communication wires or a thermostat. Once corrections have been made to wiring or the thermostat, emergency mode must be turned off and the system returned to normal operation (this applies to both the indoor and outdoor units). **NOTE:** Emergency mode does not control to a specific room temperature set point. Exact room temperature achieved is related to the building load at the time emergency mode is activated. This is only a temporary solution.

At first inspection, if the outdoor unit is displaying one of the following error codes: E51 (outdoor communication error), Eb0 (no indoor airflow), Eb9 (low indoor airflow), Ed2 (Indoor unit is too small and cannot provide airflow of outdoor unit) or the indoor unit (CAPE(A)*/CHPE*) is displaying one of the following error codes: E76 (no outdoor unit or indoor unit communications), E77 (no thermostat communications), E78 (no outdoor unit or indoor unit communications), it is acceptable to use emergency mode if the equipment cannot be immediately fixed. Cycling power to the equipment may temporarily clear error codes but doing so may not fix the underlying problem. **NOTE:** If after initial power up communication issues occur due to faulty wires or a thermostat these error codes may not be displayed.

In emergency mode, the unit will operate according to the mode selected on the appropriate dip switches. Operation in emergency mode must be limited to a minimum and should be viewed as a temporary solution before the issue with the unit is resolved and system operates in normal mode.

NOTE: In the emergency operation, the operating status will not be shown in the thermostat status menu or on the outdoor 7-segment displays. The 7-segment displays on the indoor unit (CAPE(A)*/CHPE*) control board will display “EE”.

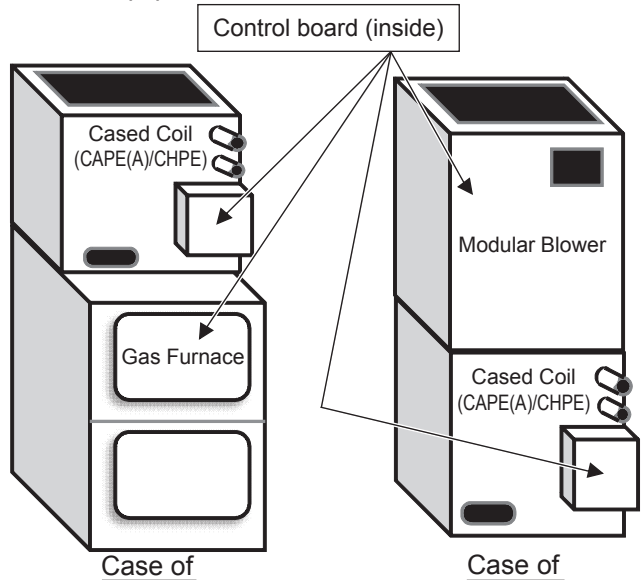
1. HEATING EMERGENCY MODE

Emergency Heating Mode is to be used when communication between each equipment is not functioning properly. This mode uses Gas Furnace or Modular Blower (electric heater). There are the following steps to setup Heating Emergency Mode:

WARNING

WHEN SETTING AND WIRING, BE SURE TO TURN OFF THE POWER OF EQUIPMENT.

1) Remove the thermostat communication wirings (1, 2, R and C) of all connected equipment (CAPE(A)*/CHPE*, Gas Furnace/Modular Blower, Outdoor unit and thermostat) from the communication terminals.
   Communication terminals are on control board inside each equipment.



Case of Cased Coil + Gas Furnace

Case of Cased Coil + Modular Blower

2) Reconnect the wirings to the communication terminal of the Gas Furnace or Modular Blower.
   (Short-circuit the communication terminal with wirings.)
   Connect the wiring so that the Gas Furnace or Modular Blower alone operates in the Heating Emergency Mode without using the Thermostat.
   Refer to the service manual of the Gas Furnace or Modular Blower for wiring connection points in the Heating Emergency Mode.
3) Set the Cased coil (CAPE(A)*/CHPE*) to Heating Emergency Mode.
   (Set dip switches S-21 to OFF and S-22 to ON of switch bank DS-6 on the Cased Coil control board.)
4) Operation starts in Heating Emergency Mode when the power of the equipment is turned on.
   (It is not necessary to set the Heating Emergency Mode with the dip switch in the outdoor unit.

NOTE: During the Heating Emergency Mode, outdoor unit must stop operation. When proper communication is established, these settings must be restored to default. You must also restore the thermostat communication wirings of all the equipment.

Switch Bank DS-6 Indoor (CAPE(A)*/CHPE*) Control Board Settings			
Function		**S-21**	**S-22**
Normal operation		OFF*	OFF*
Emergency Mode	Cooling Emergency mode	ON	OFF
	Heating Emergency mode	OFF	ON

Switch Bank DS-2 Outdoor Control Board Settings			
Function		**S-1**	**S-2**
Normal operation		OFF*	OFF*
Emergency Mode	Cooling Emergency mode (30-50%)	Either switch ON	
	Cooling Emergency mode (70%)	ON	ON

NOTE: Default factory settings are marked with *.

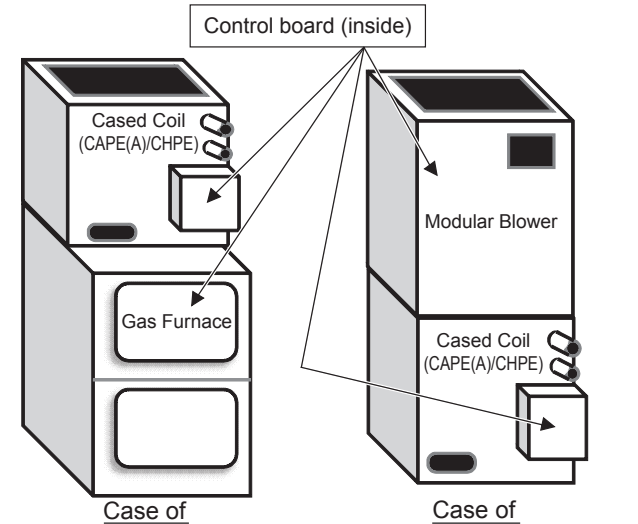
2. COOLING EMERGENCY MODE

Cooling Emergency Mode is to be used when communication between the indoor and outdoor units is not functioning properly and temporary cooling operation is required. This mode enables the outdoor unit and indoor unit to run independently of each other. There are the following steps to setup Cooling Emergency Mode:

⚠ WARNING

When setting and wiring, be sure to turn off the power of equipment.

1) Remove the thermostat communication wirings (1, 2, R and C) of all connected equipment (CAPE(A)*/ CHPE*, Gas Furnace/Modular Blower, Outdoor unit and thermostat) from the communication terminals. Communication terminals are on control board inside each equipment.



2) Reconnect the wirings to the communication terminal of the Gas Furnace or Modular Blower.
(Short-circuit the communication terminal with wirings.)
Connect the wiring so that the Gas Furnace or Modular Blower alone operates in the Cooling Emergency Mode without using the Thermostat.
Refer to the service manual of the Gas Furnace or Modular Blower for wiring connection points in the Cooling Emergency Mode.
3) Set the cased coil (CAPE(A)*/CHPE*) to Cooling Emergency Mode.
(Set dip switches S-21 to ON and S-22 to OFF of switch bank DS-6 on Cased Coil control board.)
4) Select the desired cooling level at the outdoor unit (there are 3 levels available: Low Cool Level, Medium Cool Level, High Cool Level selectable by dip switch bank DS-2 on the outdoor unit).
See Dip Switch Position S-1 and S-2 Table for cooling level selection.
5) Operation starts in Cooling Emergency Mode when the power of the equipment is turned on.

⚠ WARNING

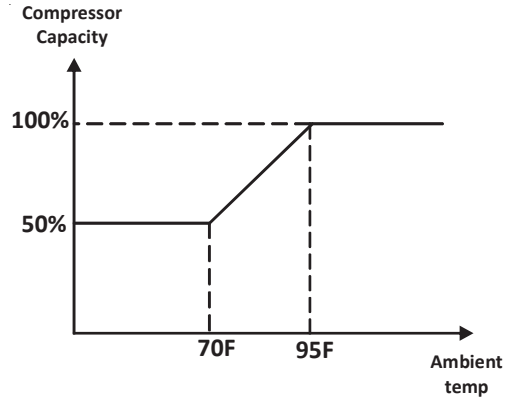
Turn on the power supply of indoor unit first.

During operation the indoor unit will provide constant airflow as selected (even if the compressor has stopped). The indoor unit will continue to operate the electronic expansion valve for refrigerant superheat control and the compressor will cycle at the interval selected by dip switch bank DS-2.

DS-2 Dip Switch Position (Outdoor Unit)		Function
S-1	S-2	
OFF	OFF	Normal Operation
Either switch ON		Emergency mode (30-50%)
ON	ON	Emergency mode (70%)

NOTE: Reconnect the Emergency cooling mode wirings to the communication terminal of Gas Furnace or Modular Blower before setting outdoor DS-2 dip switch settings. Otherwise, the compressor may be damaged in operation.

NOTE: When proper communication is established, these switches must be restored to default.
You must also restore the thermostat communication wirings of all the equipment.
The compressor speed will automatically adjust based on the outdoor ambient temperature.
If ambient temperature is higher than 95°F, the outdoor unit can operate at 100% compressor speed.
If ambient temperature is lower than 70°F, the unit will run at 50% compressor speed.
Between 95°F and 70°F, the compressor speed will adjust linearly as shown.



Dip Switch Default Factory Settings			
Switch #		**Setting**	**Function**
ID DS-1	1	OFF	No Use
	2	OFF	No Use
	3	OFF	No Use
	4	OFF	No Use
ID DS-2	5	OFF	No Use
	6	OFF	No Use
	7	OFF	No Use
	8	OFF	No Use
ID DS-3	9	OFF	No Use
	10	OFF	No Use
	11	OFF	No Use
	12	OFF	No Use
ID DS-4	13	OFF	No Use
	14	OFF	No Use
	15	ON	No Use
	16	OFF	No Use
ID DS-5	17	ON	Emergency EEV Opening
	18	OFF	Emergency EEV Opening
	19	OFF	EEV Emergency Mode**
	20	OFF	No Use
ID DS-6	21	OFF	Emergency mode (Cooling & Heating Emergency Mode)
	22	OFF	Emergency mode (Cooling & Heating Emergency Mode)
	23	OFF	No Use
	24	OFF	No Use
OD DS-1	1	ON	CT Communication Enable*
	2	ON	CT Communication Enable*
OD DS-2	1	OFF	Cooling Emergency mode*
	2	OFF	Cooling Emergency mode*

* Must be set at factory setting to operate the normal mode.

** Must be set at factory setting in indoor unit with EEV. It's prohibited to change setting.

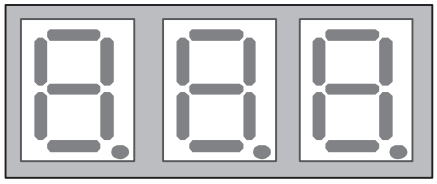
SETTING THE MODE DISPLAY

MODE DISPLAY INTRODUCTION

A 3-digit display is provided on the printed circuit board (PCB) as a backup tool to the thermostat for reading faults, fault history, monitoring and setting up the air conditioner. Follow the information provided in this section to learn how to use the mode display.

DISPLAY

The display consists of 3 digits.





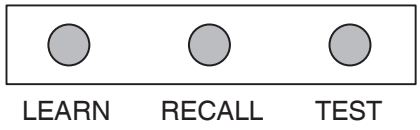
OFF

ON

Blink interval: 0.4 sec. On - 0.4 sec. Off

DISPLAY BUTTON LAYOUT

The display buttons shown can be used to navigate and select items:



MODES

There are 5 modes which can be accessed using the setting display:
“FAULT CODE, FAULT HISTORY, MONITORING, SETTING MODE 1” and “SETTING MODE 2”.

To enter any of these modes, use the schemes shown in this section. Each mode has its own corresponding “Screen #” within the display itself which allows the user to navigate and use the features. (Example: The Fault Code is accessed and displayed from “Screen Zero” of the 7-segment display. The Fault History is accessed and displayed using “Screen One” of the display, etc.)

MODE	FUNCTION	DISPLAY SCREEN #
Fault Code Display	Present fault (if any).	0 (Default)
Fault Code History	6 Recent faults stored.	1
Monitoring Mode	*Monitors system values.	2
Setting Mode 1	*Can change system settings	3
Setting Mode 2	*Can change system settings.	4

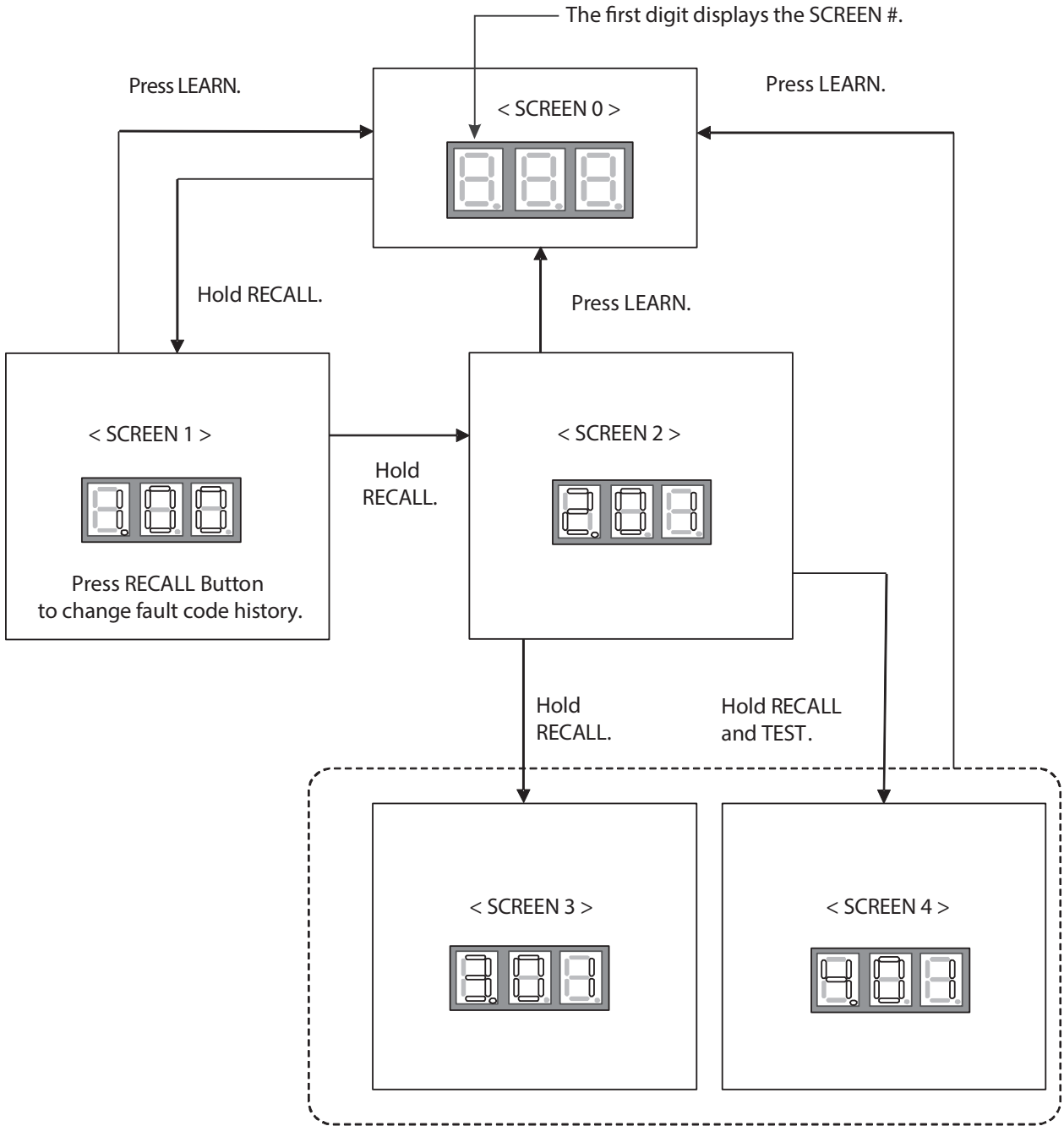
**See tables at the end of this section.*

SETTING THE MODE DISPLAY

NAVIGATING THROUGH THE DISPLAY SCREENS

SCREEN 0 The home or default screen on the display. This shows the most recent fault.
SCREEN 1 To access, hold the “RECALL” button from screen 0 - 5 seconds.
SCREEN 2 To access, hold the “RECALL” button from screen 1 - 5 seconds.
SCREEN 3 To access, hold the “RECALL” button from screen 2 - 5 seconds.
SCREEN 4 To access, hold the “RECALL” and “TEST” buttons simultaneously - 5 seconds.

To return to SCREEN 0 of the display, press the LEARN button.

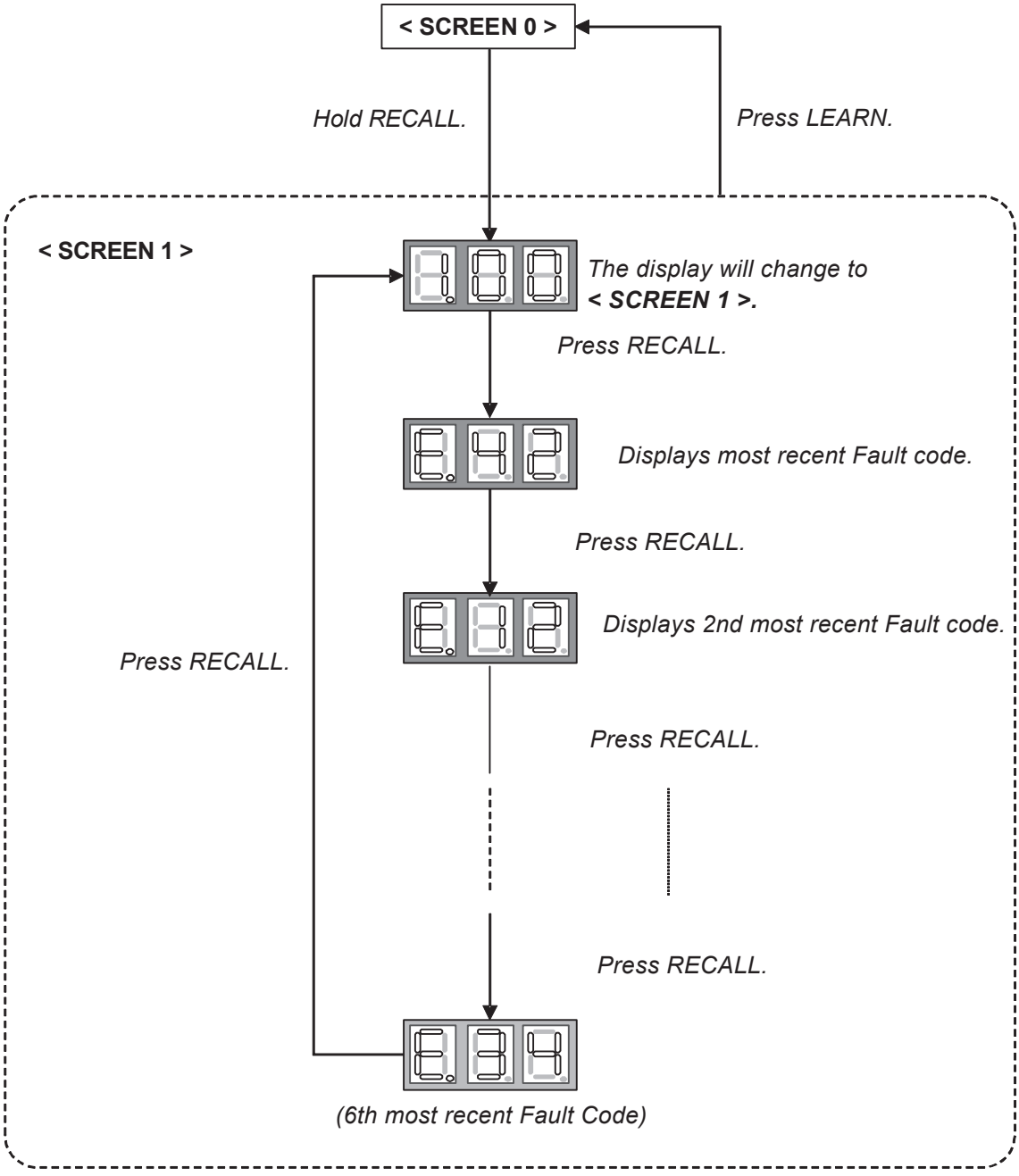


SETTING THE MODE DISPLAY

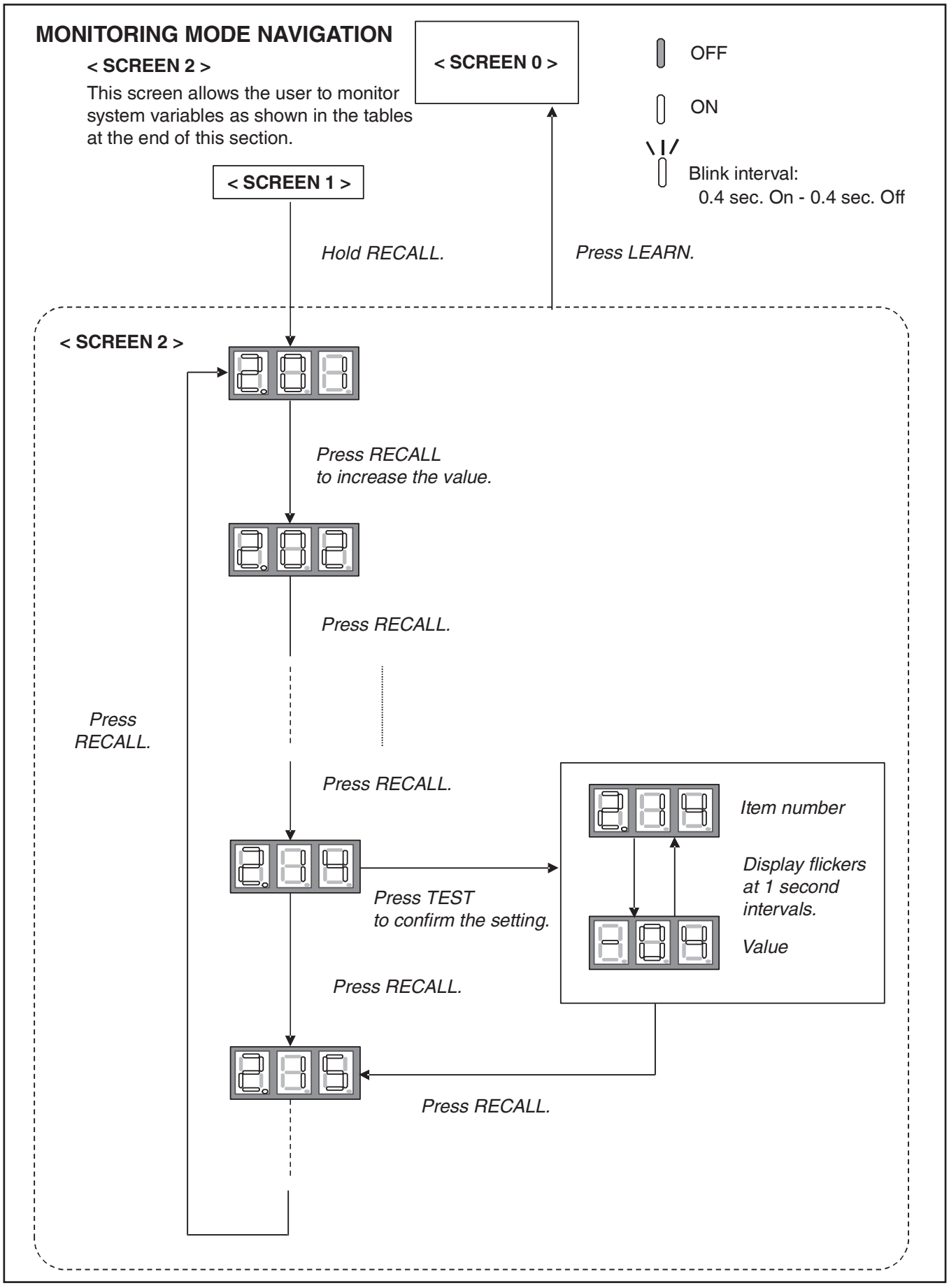
FAULT CODE HISTORY NAVIGATION

< SCREEN 1 >

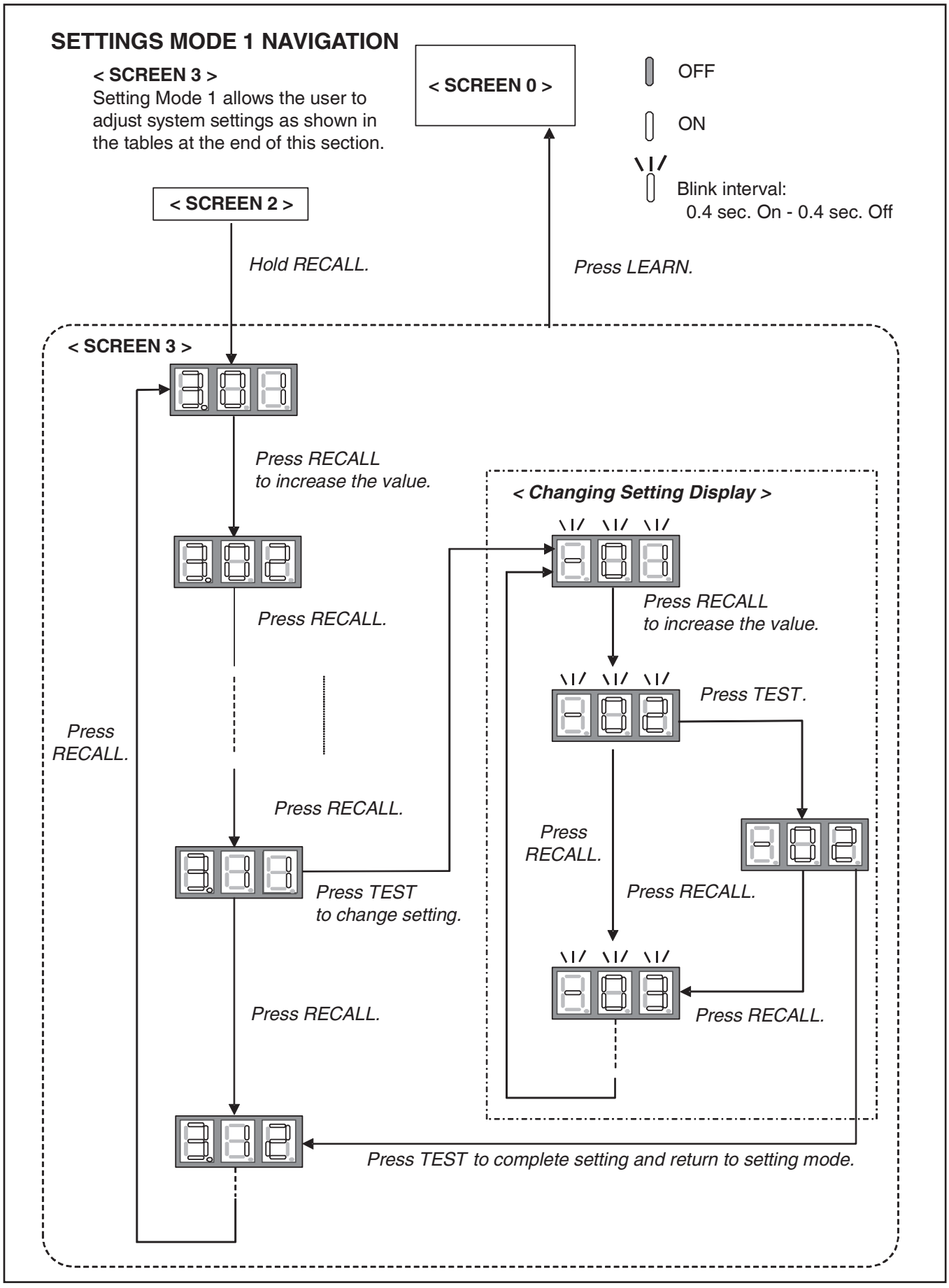
This mode will allow the user to see the six most recent system faults.
For a list of the fault codes, please see the TROUBLESHOOTING tables in this document.



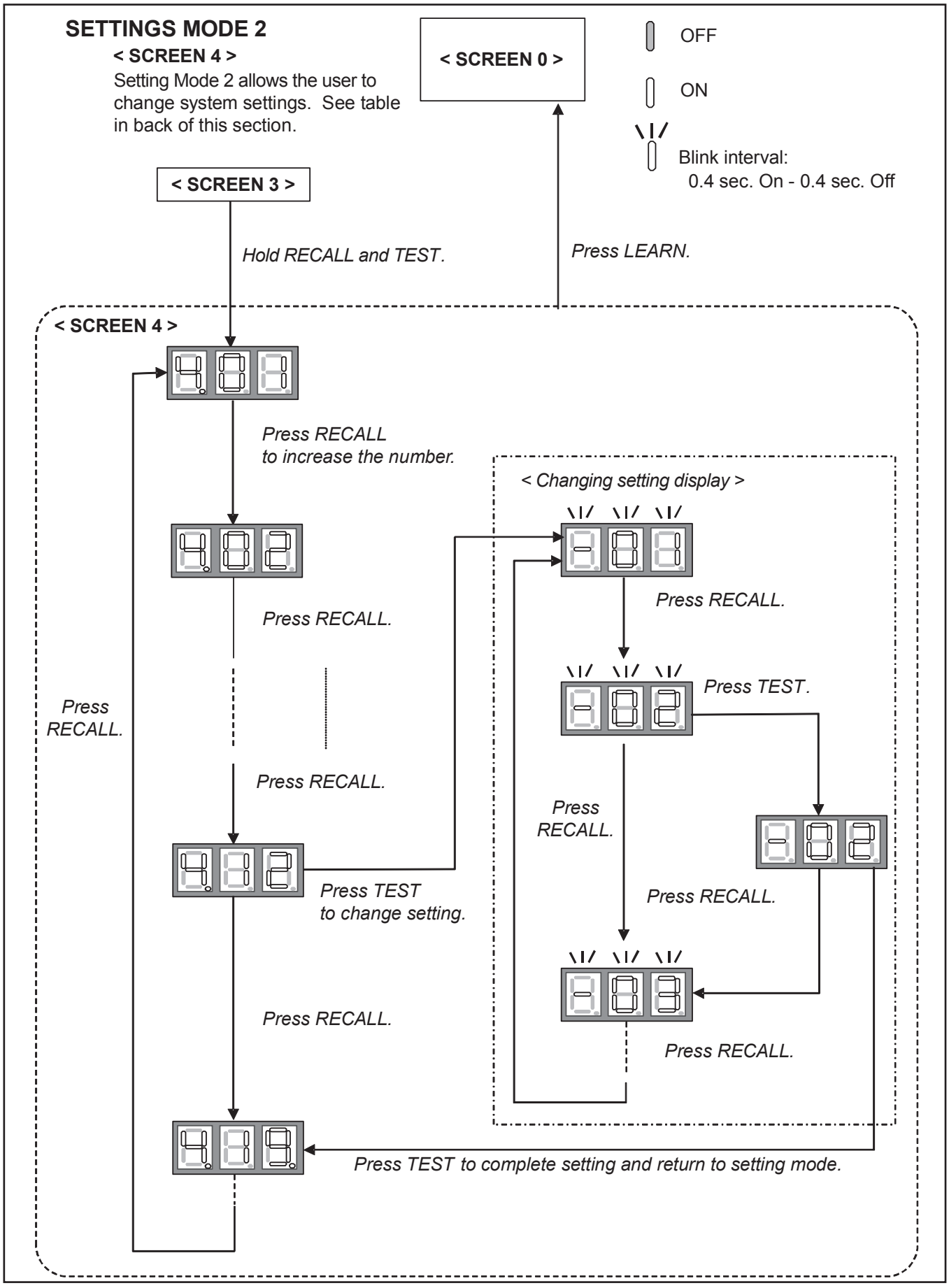
SETTING THE MODE DISPLAY



SETTING THE MODE DISPLAY



SETTING THE MODE DISPLAY



7-SEGMENT DISPLAY

SCREEN 0 (Display FAULT CODE)

Setting No.	Contents	Notes
1	Fault code (present)	-

SCREEN 1 (Display FAULT CODES)

Setting No.	Contents	Notes
1	Fault code (latest)	Latest
2	Fault code (2nd)	2nd
3	Fault code (3rd)	3rd
4	Fault code (4th)	4th
5	Fault code (5th)	5th
6	Fault code (6th)	6th

SCREEN 2 (MONITOR MODE)

Setting No.	Contents	Notes
1	Compressor operation time	unit: hr (Multiply by 200)
2	Operation code	0: Stop 1: Cooling Startup 3: Oil Return Operation 6: Cooling Operation
3	Compressor Reduction Mode	0:OFF, 1: ON
4	% Demand	unit: % (Cut off the decimal first place)
5	Act % demand	unit: % (Cut off the decimal first place)
6	Requested ID CFM	unit: CFM (Multiply by 10)
7	Reported ID CFM	unit: CFM (Multiply by 10)
8	Outdoor FAN RPM	unit: RPM (Multiply by 10)
9	Ta (Outdoor Air Temperature)	unit: F
10	Td (Discharge Temperature)	unit: F
11	Tm (Outdoor Coil Temperature)	unit: F
13	Tl (Liquid Temperature)	unit: F
14	Pressure Sensor	unit: PSI
15	Ts (Suction Temperature)	unit: F

7-SEGMENT DISPLAY

SCREEN 3 (SETTING MODE 1)

Setting No.	Contents	Setting			Installer/Serviceman Notes
1	Cool Airflow Trim High*	0:-15% 1:-12% 2:-9% 3:-6% 4:-3%	**5:0%** 6:3% 7:6%	8:9% 9:12% 10:15%	
2	Cool Airflow Trim Int	0:-15% 1:-12% 2:-9% 3:-6% 4:-3%	**5:0%** 6:3% 7:6%	8:9% 9:12% 10:15%	
3	Cool Airflow Trim Low	0:-15% 1:-12% 2:-9% 3:-6% 4:-3%	**5:0%** 6:3% 7:6%	8:9% 9:12% 10:15%	
4	Cool Profile	0:A 1:B	2:C	**3:D**	
5	Cool ON Delay	**0:5sec.** 1:10sec.	2:20sec.	3:30sec.	
6	Cool OFF Delay	**0:30sec.** 1:60sec.	2:90sec.	3:120sec.	
7	Dehumidification Select	**0:ON**	1:OFF		

* *3.0 ton with D*96VC0403B/0603B, D*80VC0603B/0803B, D*80VC0804C and MBVC1200 combination trim 9:12% and 10:15% settings are invalid. Trimmed up CFM makes miss matching error.*
3.0 ton with CAPEA3026B4 downflow and CAPEA3026C4 downflow combination trim do not setting positive (–15% ≤ Trim ≤ 0%).
*5.0 ton with D*96VC0804C, D*97MC0804C and DM80VC0804C combination trim 8:9%, 9:12% and 10:15% settings are invalid. Trimmed up CFM makes miss matching error.*
3.5 ton with CHPE3743C4 combination trim setting up to 6% only (–15% ≤ Trim ≤ +6%).

NOTE: Parameters as per factory setting are highlighted in bold and underlined.

7-SEGMENT DISPLAY

SCREEN 4 (SETTING MODE 2)

Setting No.	Contents	Setting	Installer/Serviceman Notes
2	Set Maximum Current	N/A	Future Use
3	Vertical Rise	0:Same Level **1:Outdoor Lower** 2:Indoor Lower	
4	System Verification Test	0:ON **1:OFF**	
9	Charge Mode	0:ON **1:OFF**	
10	Maximum Compressor RPS for Cooling	Refer to page 29.	
12	BOOST MODE Selection	**0:ON** 1:OFF	
13	BOOST MODE Temperature	0:105F, **1:100F**, 2:95F, 3:90F, 4:85F, 5:80F, 6:75F, 7:70F, 8:Always ON	
15	Night mode	**0:OFF** 1:ON	
16	Noise down level (In case of CTK04)	0:LEVEL1 **1:LEVEL2** 2:LEVEL3	
17	Night mode start (In case of CTK04)	**0:-2Hour**, 1:-1Hour, 2:Standard, 3:+1Hour, 4:+2Hour	
18	Night mode end (In case of CTK04)	0:-2Hour, 1:-1Hour, 2:Standard, 3:+1Hour, **4:+2Hour**	
19	Capacity priority (In case of CTK04)	0:OFF **1:ON**	

NOTE: Parameters as per factory setting are highlighted in bold and underlined.

TROUBLESHOOTING

OUTDOOR UNIT ERROR CODES

ClimateTalk Fault Code	PCB LED Display	Transmitted ClimateTalk Message	Thermostat Fault	Probable Causes	Corrective Actions
12	**E12**	**OD CTRL FAIL1**	Indicates a general memory error.	• High electrical noise • Faulty control board	• Replace control board if necessary
13	**E13**	**HI PRESSURE C (C = CRITICAL)**	This error indicates the equipment is experiencing frequent high pressure faults.	• Blocked/restricted condenser coil and/or lines • Stop valve not completely open • Overcharge • Outdoor fan not running • High pressure switch (HPS) inoperable • Faulty indoor EEV coil • Faulty indoor EEV • Faulty control board	• Check and clean condenser coil and/or lines • Check the opening of stop valve, should be full open; Repair/replace if needed • Check refrigerant charge level; Adjust if needed • Check outdoor fan motor & wiring; Repair/replace if needed • Check indoor EEV; Replace if needed • Check indoor EEV coil; Replace if needed • Replace control board if necessary
14	**-**	**HI PRESSURE M (M = MINOR)**	This error indicates the equipment is experiencing frequent high pressure faults. Control has determined continued operation is acceptable. This indicates they may be a problem with the equipment.	• Blocked/restricted condenser coil and/or lines • Stop valve not completely open • Overcharge • Outdoor fan not running • High pressure switch (HPS) inoperable • Faulty indoor EEV coil • Faulty indoor EEV • Faulty control board	• Check and clean condenser coil and/or lines • Check the opening of stop valve, should be full open; Repair/replace if needed • Check refrigerant charge level; Adjust if needed • Check outdoor fan motor & wiring; Repair/replace if needed • Check indoor EEV; Replace if needed • Check indoor EEV coil; Replace if needed • Replace control board if necessary
15	**E15**	**LOW PRESSURE C**	This error indicates the equipment is experiencing frequent low pressure faults.	• Stop valve not completely open • Restriction in refrigerant lines • Low refrigerant charge • Refrigerant leak • Low pressure sensor inoperable or not properly connected • Indoor fan motor not functioning correctly • Faulty indoor EEV coil • Faulty indoor EEV • Faulty control board	• Check the opening of stop valve, should be full open; Repair/replace if needed • Check for restrictions in refrigerant line; Repair/replace if needed • Check refrigerant charge level; Adjust if needed • Test for system leaks using leak test procedure • Check the connection to low pressure sensor; Repair/replace if needed • Check indoor EEV; Replace if needed • Check indoor EEV coil; Replace if needed • Check indoor blower motor & wiring; Repair/replace if needed • Replace control board if necessary
16	**-**	**LOW PRESSURE M**	This error indicates the equipment is experiencing frequent low pressure faults. Control has determined continued operation is acceptable. This indicates they may be a problem with the equipment.	• Stop valve not completely open • Restriction in refrigerant lines • Low refrigerant charge • Refrigerant leak • Low pressure sensor inoperable or not properly connected • Indoor fan motor not functioning correctly • Faulty indoor EEV coil • Faulty indoor EEV • Faulty control board	• Check the opening of stop valve, should be full open; Repair/replace if needed • Check for restrictions in refrigerant line; Repair/replace if needed • Check refrigerant charge level; Adjust if needed • Test for system leaks using leak test procedure • Check the connection to low pressure sensor; Repair/replace if needed • Check indoor EEV; Replace if needed • Check indoor EEV coil; Replace if needed • Check indoor blower motor & wiring; Repair/replace if needed • Replace control board if necessary
17	**E17**	**COMPRESSOR FAIL**	This error indicates the equipment is experiencing frequent compressor faults.	• Stop valve not completely open • The compressor wire is lost phase • Compressor motor failure	• Check the opening of stop valve, should be full open; Repair/replace if needed • Check the wire between control board and compressor • Inspect compressor motor for proper function; Replace if necessary
18	**E18**	**OD CTRL FAIL2**	Indicates the control board may need to be replaced.	• Outdoor fan motor not connected properly • Faulty control board • Electrical noise	• Check wiring from Outdoor fan motor to control board; Repair if needed • Replace control board if necessary
19	**E19**	**PCB OR FAN FAIL**	This error indicates the equipment is experiencing frequent outdoor control board and/or motor faults.	• Obstruction in fan rotation • Outdoor fan motor not connected properly • Outdoor fan not running • Faulty control board • Electrical noise	• Check and clean grille of any debris • Check wiring from Outdoor fan motor to control board; Repair if needed • Check outdoor fan motor & wiring; Repair/replace if needed • Replace control board if necessary
21	**E21**	**EEV CTRL FAIL**	This error indicates the equipment is experiencing frequent low discharge superheat faults.	• Thermistors inoperable or improperly connected • Faulty indoor EEV coil • Faulty indoor EEV • Overcharge • Faulty pressure sensor • Faulty control board	• Check the connection to thermistors; Repair/replace if needed • Check indoor EEV coil; Repair/replace if needed • Check indoor EEV; Replace/repair if needed • Check refrigerant charge level; Adjust if needed • Check pressure sensor; Repair/replace if needed • Replace control board if necessary
22	**E22**	**HI DISCH TEMP**	This error indicates the equipment is experiencing frequent high discharge temperature faults. Discharge thermistor is not put in correct position.	• Discharge thermistor inoperable or improperly connected • Discharge thermistor is put in incorrect position or off • Jumper wire (X33A) is put in incorrect position or off • Low refrigerant charge • Overcharge • Faulty compressor	• Check discharge thermistor resistance and connections; Repair/replace as needed • Check discharge thermistor position • Check jumper wire position (X33A) • Check refrigerant charge level; Adjust if needed • Check the compressor; Repair/replace if needed
23	**E23**	**DISCH TEMP FAIL**	The control has detected that the Discharge Temperature Sensor is out of range.	• Discharge thermistor inoperable or improperly connected	• Check discharge thermistor resistance and connections; Repair/replace as needed
24	**E24**	**HPS OPEN**	The high pressure switch is open.	• High pressure switch (HPS) inoperable	• Check resistance on HPS to verify operation; Replace if needed
25	**E25**	**AIR SENSOR FLT**	The outdoor air temperature sensor is open or shorted.	• Faulty outdoor thermistor sensor or disconnect	• Inspect and test sensor; Replace sensor if needed

TROUBLESHOOTING

OUTDOOR UNIT ERROR CODES

ClimateTalk Fault Code	PCB LED Display	Transmitted ClimateTalk Message	Thermostat Fault	Probable Causes	Corrective Actions
26	**E26**	**PRESSURE SENSOR**	The control determines that the pressure sensor is not reacting properly.	• Low pressure sensor inoperable or not properly connected	• Check the connection to low pressure sensor; Repair/ replace if needed
28	**E28**	**COIL TEMP FAIL2**	The control has detected that the Outdoor Coil Temperature Sensor is out of range.	• Outdoor coil thermistor inoperable or not properly connected	• Check the connection to OD coil thermistor; Repair/ replace if needed
29	**E29**	**LIQ TEMP FAIL**	The control has detected that the Liquid Temperature Sensor is out of range.	• Liquid thermistor inoperable or not properly connected	• Check the connection to liquid thermistor; Repair/replace if needed
30	**E30**	**OD CTRL FAIL3**	Indicates the control board may need to be replaced.	• Wiring to control board disconnected • Faulty control board • Electrical noise	• Check wiring to control board; Repair as needed • Replace control board if necessary
32	**E32**	**HI TEMP CTRL1**	This error indicates the equipment is experiencing high temperature faults on the outdoor control board.	• Ambient air conditions too high • Stop valve not completely open	• Cycle power; re-try during usable ambient temperature range
33	**-**	**HI TEMP CTRL2**	This error indicates the equipment is experiencing high temperature faults on the outdoor control board. Control has determined continued operation is acceptable. This indicates there may be a problem with the equipment.	• Ambient air conditions too high • Stop valve not completely open	• Cycle power; re-try during usable ambient temperature range
34	**E34**	**CURRENT SPIKE**	Board detected a high current condition. This indicates the potential for a short circuit.	• Current spike in supply • Stop valve not completely open • The compressor wire is lost phase • Faulty control board • Faulty compressor	• Check power supply for in-rush current during startup or steady state operation • Check the opening of stop valve, should be full open; Repair/replace if needed • Check the wire between control board and compressor • Replace control board if necessary • Check the compressor; Repair/replace if needed
35	**E35**	**HIGH CURRENT**	Board detected a high current condition.	• Short circuit condition • Stop valve not completely open • Overcharge • Faulty control board • Faulty compressor	• Check installation clearances. • Check the opening of stop valve, should be full open; Repair/replace if needed • Check refrigerant charge level; Adjust if needed • Replace control board if necessary • Check the compressor; Repair/replace if needed.
36	**E36**	**STARTUP ERROR**	The control encountered an abnormal condition during the startup procedure.	• Blocked/restricted condenser coil and/or lines • The compressor wire is lost phase • Inconsistent compressor load • Faulty control board	• Check and clean condenser coil and/or lines • Check the wire between control board and compressor • Replace control board if necessary
37	**E37**	**OD CTRL FAIL4**	Indicates the control board may need to be replaced.	• Outdoor fan motor not connected properly • Faulty control board	• Check wiring from Outdoor fan motor to control board; Repair if needed • Replace control board if necessary
38	**E38**	**COMP VOLTAGE**	The control has detected a voltage related issue with the compressor.	• High or low voltage from supply • The compressor wire is lost phase • Faulty control board	• Correct low/high line voltage condition; Contact local utility if needed • Check the wire between control board and compressor • Replace control board if necessary
39	**E39**	**OD CTRL FAIL5**	Indicates the control board may need to be replaced.	• Thermistors inoperable or improperly connected • Faulty control board	• Check the connection to thermistors; Repair/replace if needed • Replace control board if necessary
40	**E40**	**COMP MISMATCH**	Control determines that its compressor requirement is different than the compressor capability.	• Memory card not correct • Control board mismatch	• Check memory card data vs. air conditioner model • Verify control board size vs. air conditioner model; Replace control board if necessary
41	**E41**	**LOW REFRIGERANT**	The control has detected a low refrigerant condition.	• Refrigerant leak • Low refrigerant charge • Thermistors inoperable or not properly connected	• Test for system leaks using leak test procedure • Check refrigerant charge level; Adjust if needed • Check the connection to thermistor; Repair/replace if needed
42	**E42**	**LOW LINE VOLT**	Control detects a low power supply voltage condition.	• Low line voltage supply	• Check circuit breakers and fuses; Replace if needed • Verify unit is connected to power supply as specified on rating plate • Correct low line voltage condition; Contact local utility if needed
43	**E43**	**HIGH LINE VOLT**	Control detects a high power supply voltage condition.	• High line voltage supply	• Verify unit is connected to power supply as specified on rating plate • Correct high line voltage condition; Contact local utility if needed
44	**E44**	**OP TEMP CONFIG**	The control detects the outdoor temperature outside recommended operational range. Unit may continue to operate normally.	• Ambient air conditions too high or low	• Cycle power; re-try during usable ambient temperature range
45	**E45**	**NO COOLING TEST**	The control is unable to start the Cooling mode test because indoor heat has been turned on by thermostat. Please set thermostat to off position.	• Heat provided by secondary heating source	• Turn off Furnace or heater using thermostat before operation

TROUBLESHOOTING

OUTDOOR UNIT ERROR CODES

ClimateTalk Fault Code	PCB LED Display	Transmitted ClimateTalk Message	Thermostat Fault	Probable Causes	Corrective Actions
47	**E47**	**NO SYS VER TEST**	The control is unable to start the System Verification test because indoor heat has been turned on by thermostat. Please set thermostat to off position.	• Heat provided by secondary heating source	• Turn off Furnace or heater using thermostat before operation
49	**E49**	**NO CHARGE MODE**	The control is unable to enter Charging Mode because indoor heat has been turned on by thermostat. Please set thermostat to off position.	• Heat provided by secondary heating source	• Turn off heater using thermostat before operation
50	**E50**	**LINE VOLT CTRL**	This indicates there is a voltage issue on the control board.	• High or low voltage from supply • Faulty control board	• Correct low/high line voltage condition; Contact local utility if needed • Replace control board if necessary
51	**E51**	**OD COMM ERROR**	This indicates potential communication issues have been detected by the outdoor control board.	• Communication wiring disconnected	• Check communication wiring; Repair as needed
52	**-**	**COMP FAIL MINOR**	This error indicates the equipment is experiencing frequent compressor faults. Control has determined continued operation is acceptable. This indicates there may be a problem with the equipment.	• Stop valve not completely open • The compressor wire is lost phase • Compressor motor failure	• Check the opening of stop valve, should be full open; Repair/replace if needed • Check the wire between control board and compressor • Inspect compressor motor for proper function; Replace if necessary
53	**-**	**PCB OR FAN MIN**	This error indicates the equipment is experiencing frequent outdoor control board and/or motor faults. Control has determined continued operation is acceptable. This indicates there may be a problem with the equipment.	• Obstruction in fan rotation • Outdoor fan motor not connected properly • Outdoor fan not running • Faulty control board • Noise	• Check and clean grille of any debris • Check wiring from Outdoor fan motor to control board; Repair if needed • Check outdoor fan motor & wiring; Repair/replace if needed • Replace control board if necessary
54	**-**	**EEV MINOR**	This error indicates the equipment is experiencing frequent low discharge superheat faults. Control has determined continued operation is acceptable. This indicates there may be a problem with the equipment.	• Thermistors inoperable or improperly connected • Faulty indoor EEV or indoor EEV coil • Faulty control board	• Check the connection to thermistors; Repair/replace if needed • Check indoor EEV; Replace if needed • Check indoor EEV coil; Replace if needed • Replace control board if necessary
55	**-**	**HI DIS TEMP MIN**	This error indicates the equipment is experiencing frequent high discharge temperature faults. Control has determined continued operation is acceptable. This indicates there may be a problem with the equipment.	• Discharge thermistor inoperable or improperly connected • Discharge thermistor is put in incorrect position or off • Low refrigerant charge • Overcharge • Faulty compressor	• Check discharge thermistor resistance and connections; Repair/replace as needed • Check discharge thermistor position • Check refrigerant charge level; Adjust if needed • Check the compressor; Repair/replace if needed
56	**E56**	**SUCT TEMP FAIL**	The control has detected if the Outdoor Suction Temperature Sensor is out of range.	• Suction thermistor inoperable or not properly connected	• Check the connection to suction thermistor; Repair/replace if needed • Check the obstruction inside duct work.
B0	**Eb0**	**NO ID AIRFLOW**	The estimated airflow from indoor subsystem is near to 0 CFM.	• Failed indoor blower motor • Indoor fan motor not properly connected • Too much static pressure	• Check ID fan motor wiring and connectors; Repair/replace if needed • Check ID fan motor; Replace if needed • Check the obstruction inside duct work.
B9	**Eb9**	**LOW ID AIRFLOW**	Estimated airflow from motor is lower than the airflow requirement.	• Failed indoor blower motor • Indoor fan motor not properly connected • Too much static pressure	• Check ID fan motor wiring and connectors; Repair/replace if needed • Check ID fan motor; Replace if needed
D0	**Ed0**	**NO NET DATA**	Control board does not have the necessary data for it to properly perform its functions.	• Air conditioner is wired as part of a communicating system and integrated control module does not contain any shared data.	• Replace control board if necessary
D1	**Ed1**	**INVALID DATA**	Control board does not have the appropriate data needed to properly perform its functions.	• Air conditioner is wired as part of a communicating system and integrated control module contains invalid shared data or network data is invalid for the integrated control module.	• Replace control board if necessary
D2	**Ed2**	**SYSTEM MISMATCH**	The airflow requirement is greater than the airflow capability of the indoor subsystem.	• Air conditioner is wired as part of a communicating system and air conditioner requires airflow greater than indoor unit's airflow capability • Shared data is incompatible the system or missing parameters • Communication wiring has loose connection. • Indoor unit without EEV.	• Verify shared data is correct for your specific model; Repopulate data if required • Check communication wiring. Repair as needed.
D3	**Ed3**	**INVALID CONFIG**	There is a mismatch between the shared data and the control physical hardware.	• Shared data sent to integrated control module does not match hardware configuration.	• Verify shared data is correct for your specific model; Repopulate data if required
D4	**Ed4**	**INVALID MC DATA**	The memory card data has been rejected.	• Shared data on memory card has been rejected.	• Verify shared data is correct for your specific model; Repopulate data if required

TROUBLESHOOTING

OUTDOOR UNIT ERROR CODES

Items below are messages only displayed on the thermostat screen.					
11	**E11**	**RUN SYS TEST**	This test is required at startup. Installer should navigate to the ComfortNet User Menu, choose Air Conditioner, then EQUIP TEST and SYTEM TEST. Selecting ON will run the required test. Display will clear once testing is complete.	• Incomplete SYSTEM TEST • SYSTEM TEST is running	Run the system test.

TROUBLESHOOTING

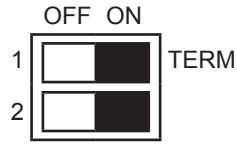
OUTDOOR UNIT ERROR CODES

Network Troubleshooting

Communication is achieved by taking the difference between a positive DC signal and a negative DC signal. The positive DC signal is termed “data 1” or “1’. Data 1 is positive with respect to ground (or common). The negative DC signal is termed “data 2” or “2”. Data 2 is negative with respect to ground (or common).

Data 1 should be approximately 2.8 volts DC. Data 2 should be approximately 2.2 volts DC. The voltage difference between data 1 and data 2 should be approximately 0.6 volts DC.

Verify that the bus DS1 dip switches are in the ON position.



The ComfortNet™ system is a fully communicating system, constituting a network. Occasionally the need to troubleshoot the network may arise. The integrated control module has some onboard tools that can be used to troubleshoot the network. These tools are: red communications LED, green receive (Rx) LED, and the learn button.

- Red communications LED – Indicates the status of the network. The table below indicates the LED status and the corresponding potential problem.
- Green receive LED – Indicates network traffic. The table below indicates the LED status and the corresponding potential problem.
- LEARN button – Used to reset the network. Press the button for approximately 5 seconds to reset the network.

Dip Switch Default Factory Settings			
Switch #		**Setting**	**Purpose**
OD DS1	**1**	ON	CT Communication Enabled
	2	ON	CT Communication Enabled
OD DS2	**1**	OFF	Cooling Emergency Mode for Future Use*
	2	OFF	Cooling Emergency Mode for Future Use*

*OD DS2 switch 1 and 2 both must be turned OFF during normal operation mode

LED COLOR	LED Status	Indication	Probable Causes	Corrective Actions
Red Communications LED (H1P)	Off	Nominal condition	• None	• None
	1 Flash	Communications Failure	• Unknown packet is received	• Depress learn button
	2 Flash	Out-of-box reset	• Control power up • Learn button depressed	• None
Green Receive LED (H2P)	Off	No power Communications error	• No power to Outdoor unit • Open fuse • Communication error	• Check circuit breakers and fuses; Replace if needed • Reset network by depressing learn button • Check communication wires (data 1/data 2 wires); Replace if needed
	1 Steady Flash	No network found	• Broken/disconnected communication wire(s) • AC is installed as a legacy/traditional system	• Check communication wires (data 1/data 2 wires); Replace if needed • Check installation type (legacy/traditional or communicating) • Check data 1/data 2 voltages
	Rapid Flashing	Nominal network traffic	• Control is “talking” on network as expected	• None
	On Solid	Data 1/Data 2 miss-wire	• Data 1 and data 2 wires reversed at indoor unit, thermostat, or outdoor unit • Short between data 1 and data 2 wires • Short between data 1 or data 2 wires	• Check communication wires (data 1/data 2 wires); Replace if needed • Check data 1/data 2 voltages

THERMISTOR RESISTANCE & TEMPERATURE CHARACTERISTICS

		Tm : Coil Tl : Liquid Ts : Suction Tgi: Indoor Gas Tli: Indoor Liquid		Td : Discharge		Ta : Ambient	
TEMP	TEMP	Thermistor Resistance	Volts	Thermistor Resistance	Volts	Thermistor Resistance	Volts
(°C)	(°F)	R (kΩ)	DC (V)	R (kΩ)	DC (V)	R (kΩ)	DC (V)
-30	-22	364.43	4.58	4759.15	4.96	362.48	4.58
-25	-13	267.00	4.45	3454.24	4.94	265.99	4.45
-20	-4	197.81	4.29	2533.62	4.92	197.31	4.28
-15	5	148.10	4.09	1877.01	4.90	147.86	4.09
-10	14	111.99	3.86	1403.82	4.86	111.88	3.86
-5	23	85.49	3.61	1059.45	4.82	85.43	3.61
0	32	65.84	3.33	806.47	4.77	65.80	3.33
5	41	51.09	3.04	618.95	4.70	51.10	3.04
10	50	39.96	2.74	478.76	4.62	39.99	2.74
15	59	31.50	2.44	373.11	4.53	31.54	2.44
20	68	25.01	2.16	292.86	4.41	25.06	2.16
25	77	20.00	1.89	231.44	4.28	20.04	1.89
30	86	16.10	1.64	184.11	4.13	16.13	1.64
35	95	13.04	1.42	147.37	3.95	13.07	1.42
40	104	10.63	1.22	118.68	3.76	10.65	1.22
45	113	8.71	1.04	96.13	3.56	8.73	1.05
50	122	7.18	0.89	78.29	3.34	7.18	0.89
55	131	5.95	0.76	64.10	3.11	-	-
60	140	4.96	0.65	52.76	2.87	-	-
65	149	4.16	0.56	43.63	2.64	-	-
70	158	3.50	0.48	36.26	2.41	-	-
75	167	2.96	0.41	30.27	2.18	-	-
80	176	2.51	0.35	25.38	1.97	-	-
85	185	2.14	0.30	21.37	1.77	-	-
90	194	1.83	0.26	18.06	1.58	-	-
95	203	1.58	0.23	15.33	1.41	-	-
100	212	1.36	0.20	13.06	1.25	-	-
105	221	1.18	0.17	11.17	1.11	-	-
110	230	1.02	0.15	9.59	0.99	-	-
115	239	0.89	0.13	8.25	0.87	-	-
120	248	0.78	0.12	7.13	0.77	-	-
125	257	0.68	0.10	6.18	0.68	-	-
130	266	0.60	0.09	5.37	0.61	-	-
135	275	0.53	0.08	4.69	0.54	-	-
140	284	0.47	0.07	4.10	0.48	-	-
145	293	0.42	0.06	3.59	0.42	-	-
150	302	0.37	0.06	3.16	0.37	-	-

PRESSURE VS TEMPERATURE CHART

R-410A Pressure vs. Temperature Chart

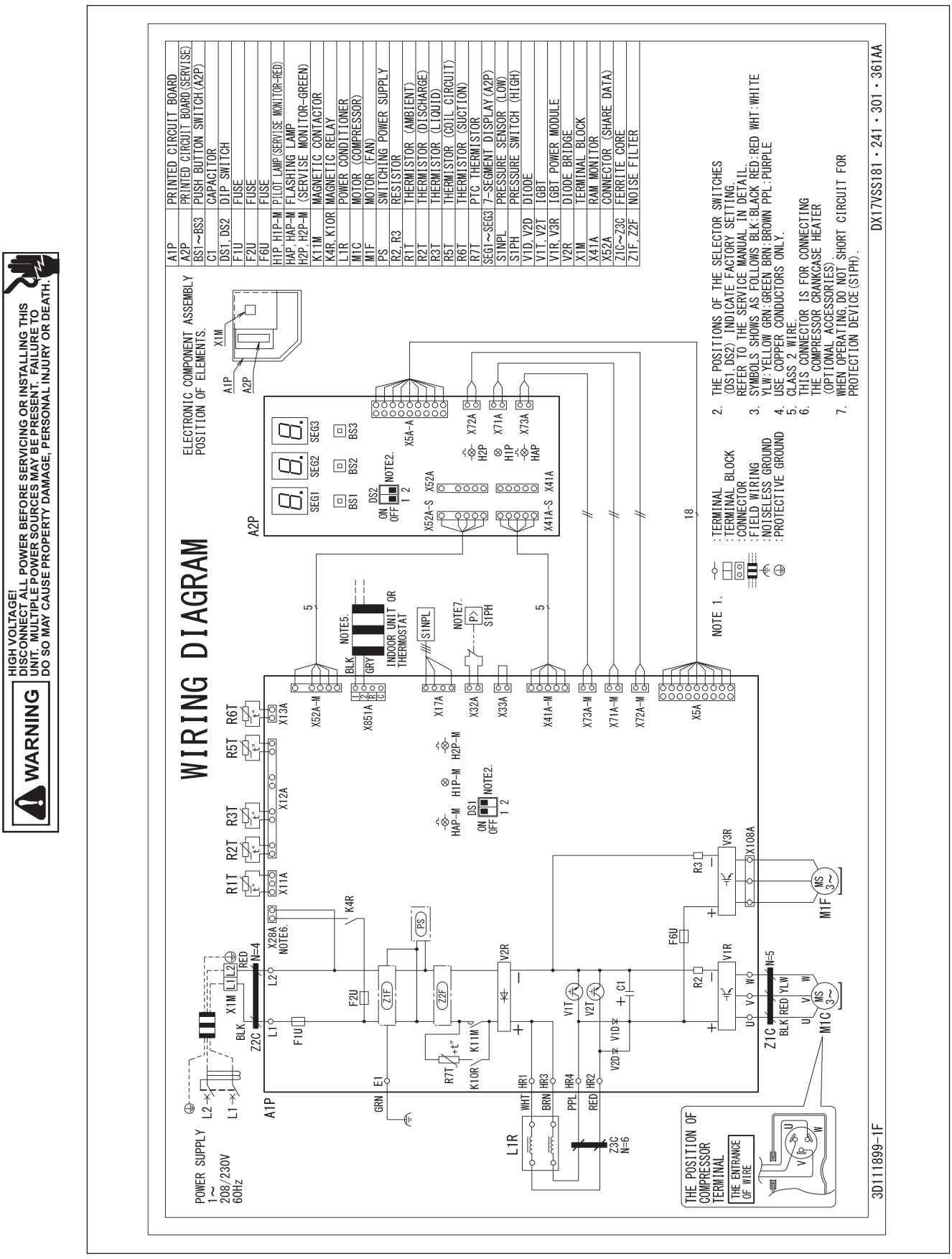
PSIG	°F	PSIG	°F	PSIG	°F	PSIG	°F	PSIG	°F	PSIG	°F
12	-37.7	114	37.8	216	74.3	318	100.2	420	120.7	522	137.6
14	-34.7	116	38.7	218	74.9	320	100.7	422	121.0	524	137.9
16	-32.0	118	39.5	220	75.5	322	101.1	424	121.4	526	138.3
18	-29.4	120	40.5	222	76.1	324	101.6	426	121.7	528	138.6
20	-36.9	122	41.3	224	76.7	326	102.0	428	122.1	530	138.9
22	-24.5	124	42.2	226	77.2	328	102.4	430	122.5	532	139.2
24	-22.2	126	43.0	228	77.8	330	102.9	432	122.8	534	139.5
26	-20.0	128	43.8	230	78.4	332	103.3	434	123.2	536	139.8
28	-17.9	130	44.7	232	78.9	334	103.7	436	123.5	538	140.1
30	-15.8	132	45.5	234	79.5	336	104.2	438	123.9	540	140.4
32	-13.8	134	46.3	236	80.0	338	104.6	440	124.2	544	141.0
34	-11.9	136	47.1	238	80.6	340	105.1	442	124.6	548	141.6
36	-10.1	138	47.9	240	81.1	342	105.4	444	124.9	552	142.1
38	-8.3	140	48.7	242	81.6	344	105.8	446	125.3	556	142.7
40	-6.5	142	49.5	244	82.2	346	106.3	448	125.6	560	143.3
42	-4.5	144	50.3	246	82.7	348	106.6	450	126.0	564	143.9
44	-3.2	146	51.1	248	83.3	350	107.1	452	126.3	568	144.5
46	-1.6	148	51.8	250	83.8	352	107.5	454	126.6	572	145.0
48	0.0	150	52.5	252	84.3	354	107.9	456	127.0	576	145.6
50	1.5	152	53.3	254	84.8	356	108.3	458	127.3	580	146.2
52	3.0	154	54.0	256	85.4	358	108.8	460	127.7	584	146.7
54	4.5	156	54.8	258	85.9	360	109.2	462	128.0	588	147.3
56	5.9	158	55.5	260	86.4	362	109.6	464	128.3	592	147.9
58	7.3	160	56.2	262	86.9	364	110.0	466	128.7	596	148.4
60	8.6	162	57.0	264	87.4	366	110.4	468	129.0	600	149.0
62	10.0	164	57.7	266	87.9	368	110.8	470	129.3	604	149.5
64	11.3	166	58.4	268	88.4	370	111.2	472	129.7	608	150.1
66	12.6	168	59.0	270	88.9	372	111.6	474	130.0	612	150.6
68	13.8	170	59.8	272	89.4	374	112.0	476	130.3	616	151.2
70	15.1	172	60.5	274	89.9	376	112.4	478	130.7	620	151.7
72	16.3	174	61.1	276	90.4	378	112.6	480	131.0	624	152.3
74	17.5	176	61.8	278	90.9	380	113.1	482	131.3	628	152.8
76	18.7	178	62.5	280	91.4	382	113.5	484	131.6	632	153.4
78	19.8	180	63.1	282	91.9	384	113.9	486	132.0	636	153.9
80	21.0	182	63.8	284	92.4	386	114.3	488	132.3	640	154.5
82	22.1	184	64.5	286	92.8	388	114.7	490	132.6	644	155.0
84	23.2	186	65.1	288	93.3	390	115.0	492	132.9	648	155.5
86	24.3	188	65.8	290	93.8	392	115.5	494	133.3	652	156.1
88	25.4	190	66.4	292	94.3	394	115.8	496	133.6	656	156.6
90	26.4	192	67.0	294	94.8	396	116.2	498	133.9	660	157.1
92	27.4	194	67.7	296	95.2	398	116.6	500	134.0	664	157.7
94	28.5	196	68.3	298	95.7	400	117.0	502	134.5	668	158.2
96	29.5	198	68.9	300	96.2	402	117.3	504	134.8	672	158.7
98	30.5	200	69.5	302	96.6	404	117.7	506	135.2	676	159.2
100	31.2	202	70.1	304	97.1	406	118.1	508	135.5	680	159.8
102	32.2	204	70.7	306	97.5	408	118.5	510	135.8	684	160.3
104	33.2	206	71.4	308	98.0	410	118.8	512	136.1	688	160.8
106	34.1	208	72.0	310	98.4	412	119.2	514	136.4	692	161.3
108	35.1	210	72.6	312	98.9	414	119.6	516	136.7	696	161.8
110	35.5	212	73.2	314	99.3	416	119.9	518	137.0		
112	36.9	214	73.8	316	99.7	418	120.3	520	137.3		

LIQUID LINE TEMPERATURE CHART

Required Liquid Line Temperature						
LIQUID PRESSURE AT SERVICE VALVE (PSIG)	REQUIRED SUBCOOLING TEMPERATURE (°F)					
	8	10	12	14	16	18
189	58	56	54	52	50	48
195	60	58	56	54	52	50
202	62	60	58	56	54	52
208	64	62	60	58	56	54
215	66	64	62	60	58	56
222	68	66	64	62	60	58
229	70	68	66	64	62	60
236	72	70	68	66	64	62
243	74	72	70	68	66	64
251	76	74	72	70	68	66
259	78	76	74	72	70	68
266	80	78	76	74	72	70
274	82	80	78	76	74	72
283	84	82	80	78	76	74
291	86	84	82	80	78	76
299	88	86	84	82	80	78
308	90	88	86	84	82	80
317	92	90	88	86	84	82
326	94	92	90	88	86	84
335	96	94	92	90	88	86
345	98	96	94	92	90	88
354	100	98	96	94	92	90
364	102	100	98	96	94	92
374	104	102	100	98	96	94
384	106	104	102	100	98	96
395	108	106	104	102	100	98
406	110	108	106	104	102	100
416	112	110	108	106	104	102
427	114	112	110	108	106	104
439	116	114	112	110	108	106
450	118	116	114	112	110	108
462	120	118	116	114	112	110
474	122	120	118	116	114	112
486	124	122	120	118	116	114
499	126	124	122	120	118	116
511	128	126	124	122	120	118

WIRING DIAGRAMS

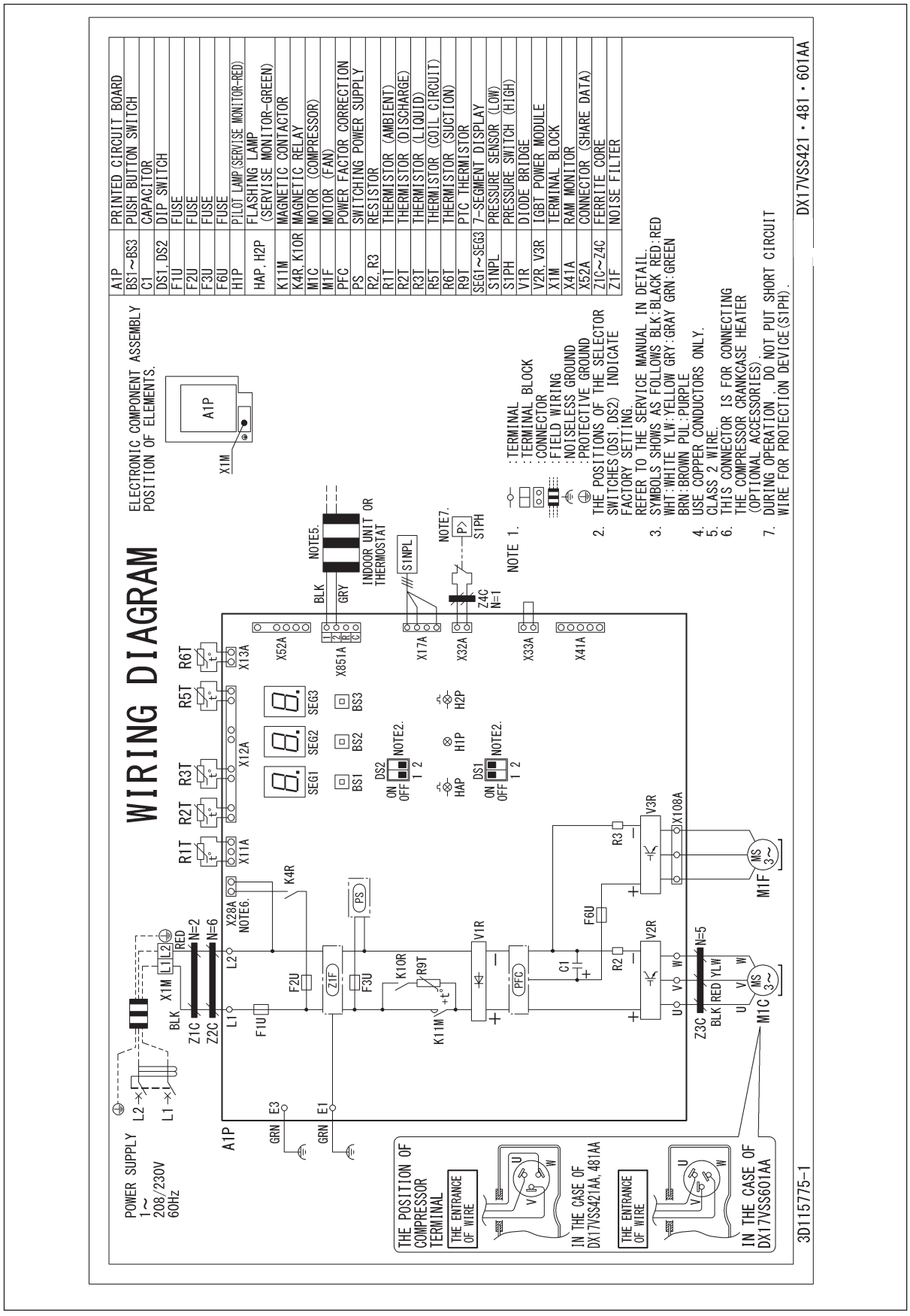
DX17VSS181/241/301/361AA



Wiring is subject to change. Always refer to the wiring diagram on the unit for the most up-to-date wiring.

WIRING DIAGRAMS

DX17VSS421/481/601AA



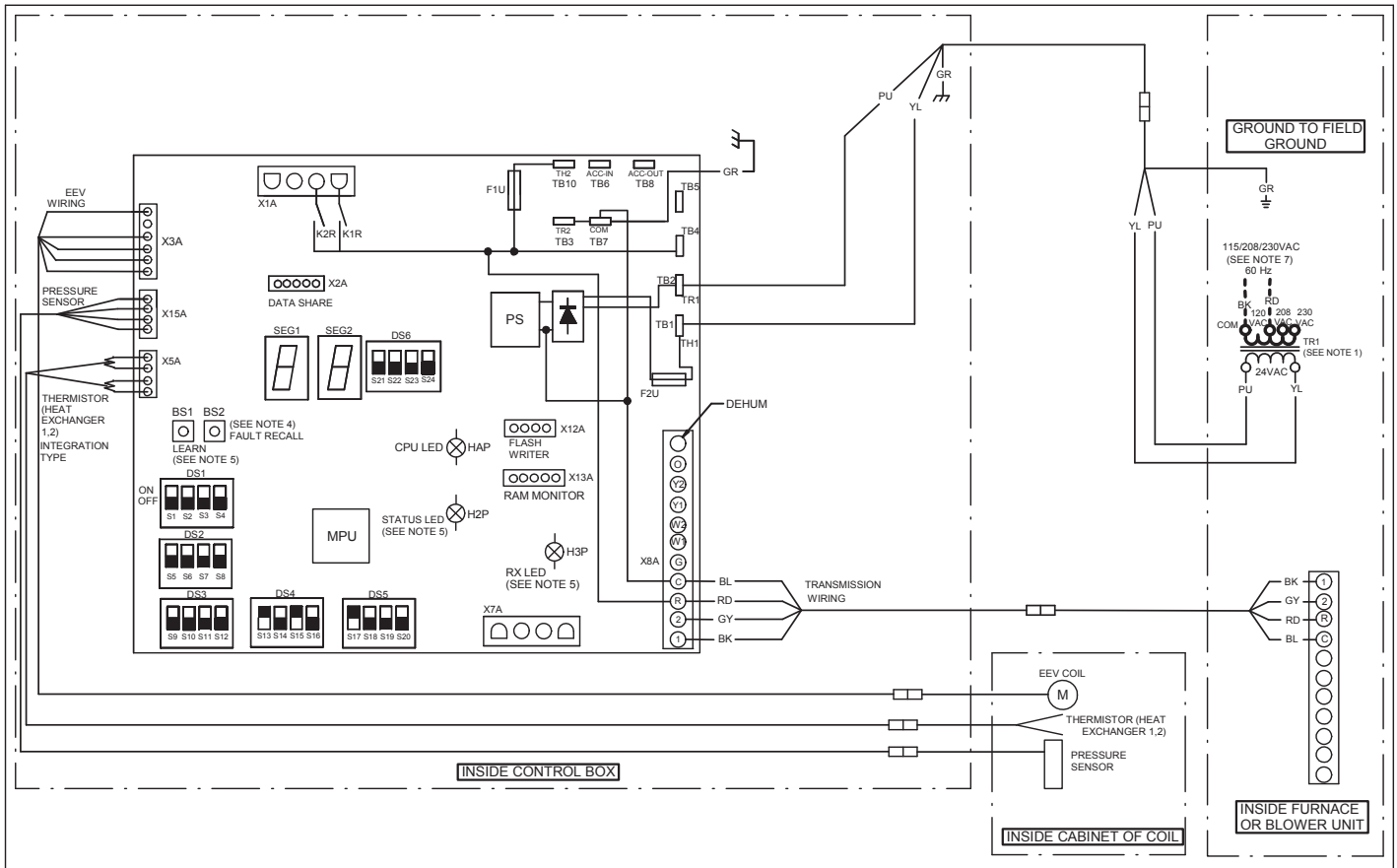
WIRING DIAGRAMS

CAPE(A)/CHPE**

NOTE: THESE INSTRUCTIONS ARE SPECIFICALLY FOR CAPE(A)*/CHPE* MODELS. DO **NOT** ATTEMPT TO APPLY THESE DIAGRAMS TO ANY OTHER MODELS.

WARNING

HIGH VOLTAGE! DISCONNECT ALL POWER BEFORE SERVICING. MULTIPLE POWER SOURCES MAY BE PRESENT. FAILURE TO DO SO MAY CAUSE PROPERTY DAMAGE, PERSONAL INJURY OR DEATH.



NOTES:
1. MANUFACTURER'S SPECIFIED REPLACEMENT PARTS MUST BE USED WHEN SERVICING.
2. IF ANY OF THE ORIGINAL WIRES AS SUPPLIED WITH THIS UNIT MUST BE REPLACED, IT MUST BE REPLACED WITH WIRING MATERIAL HAVING A TEMPERATURE RATING OF AT LEAST 105℃. USE COPPER CONDUCTORS ONLY.
3. UNIT MUST BE PERMANENTLY GROUNDED AND CONFIRM TO N.E.C AND LOCAL CODES.
4. TO RECALL THE LAST 6 FAULTS, MOST RECENT TO LEAST RECENT, DEPRESS FAULT RECALL BUTTON FOR MORE THAN 2 SECONDS WHILE IN STANDBY (NO THERMOSTAT INPUTS)
5. RED STATUS LED PROVIDES NETWORK STATUS, GREEN RX LED INDICATES NETWORK TRAFFIC. USE LEARN BUTTON TO RESET NETWORK.
6. THE POSITION OF SELECTOR SWITCHES (DS1 - DS6) INDICATE FACTORY SETTING.
7. SELECTION OF CORRECT SUPPLY VOLTAGE FOR TRANSFORMER DEPENDS ON POWER SUPPLY VOLTAGE TO GAS FURNACE OR BLOWER UNIT.
8. USE N.E.C CLASS 2 WIRE.

COLOR CODES:
BL - BLUE
RD - RED
YL - YELLOW
OR - ORANGE
BK - BLACK
GY - GREY
BR - BROWN
GR - GREEN
WH - WHITE
PU - PURPLE

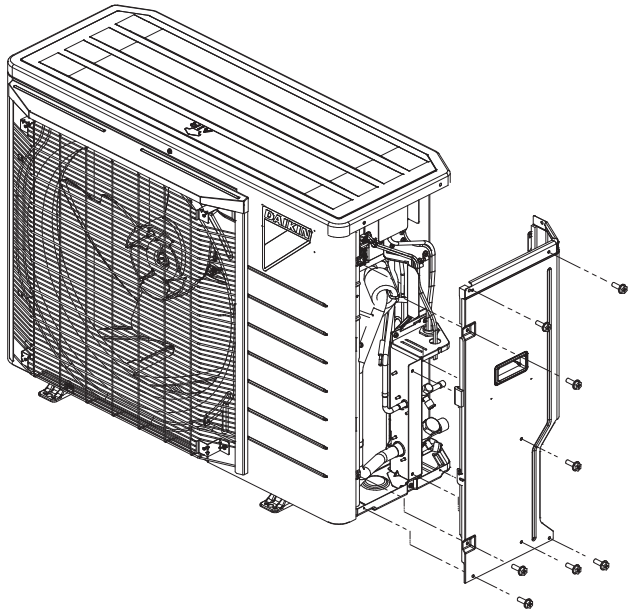
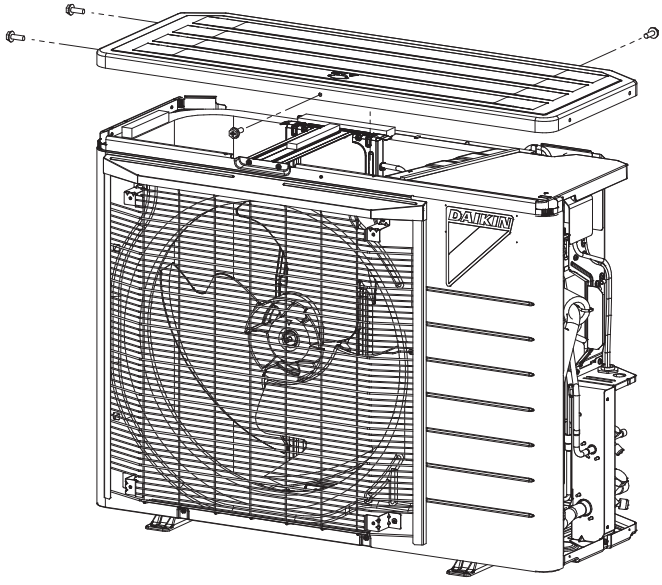
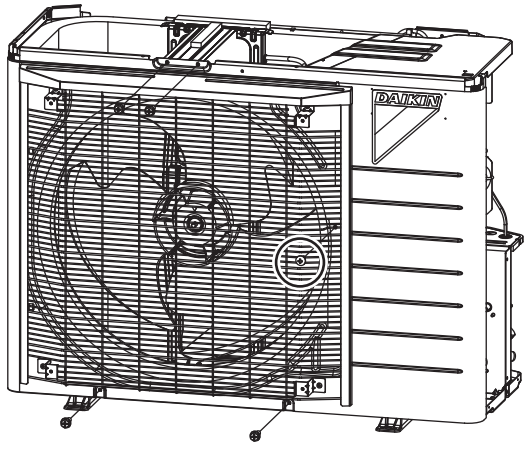
INTEGRATED CONTROL:
LOW VOLTAGE
LOW VOLTAGE FIELD
HIGH VOLTAGE
HIGH VOLTAGE FIELD
JUNCTION
TERMINAL
PLUG CONNECTION
EQUIPMENT GND
FIELD GROUND

COMPONENT CODES:
TR1 — COIL TRANSFORMER
F1U, F2U — FUSE LINK
DS1 - DS6 — SELECTOR SWITCH

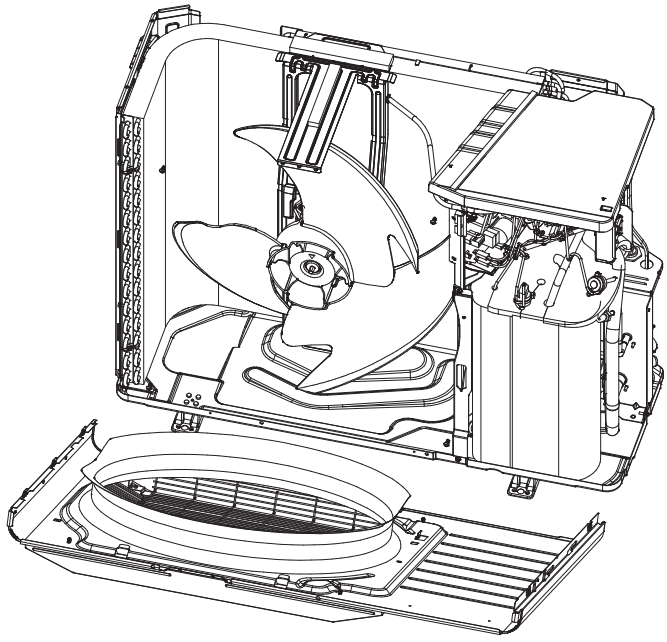
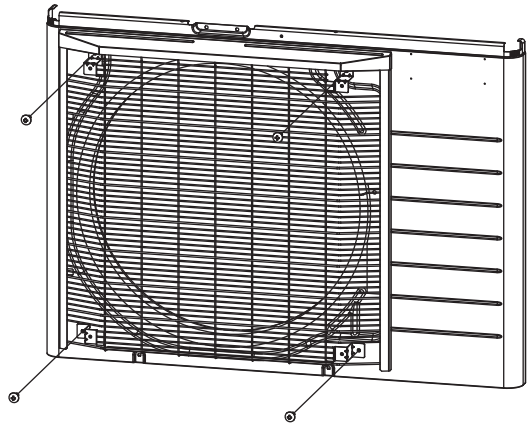
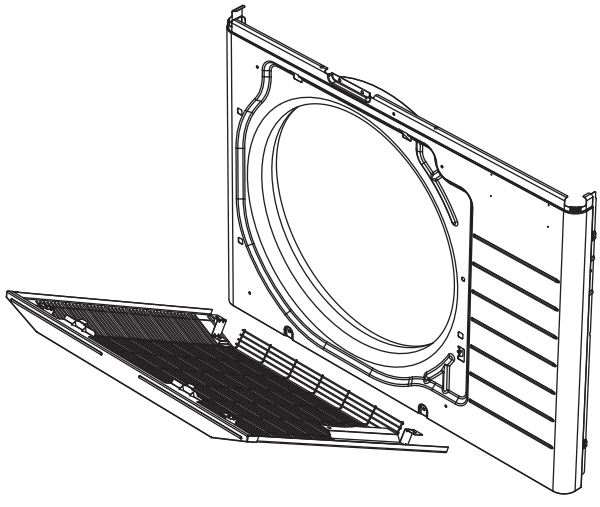
Wiring is subject to change. Always refer to the wiring diagram on the unit for the most up-to-date wiring.

REMOVAL & REASSEMBLY PROCEDURE

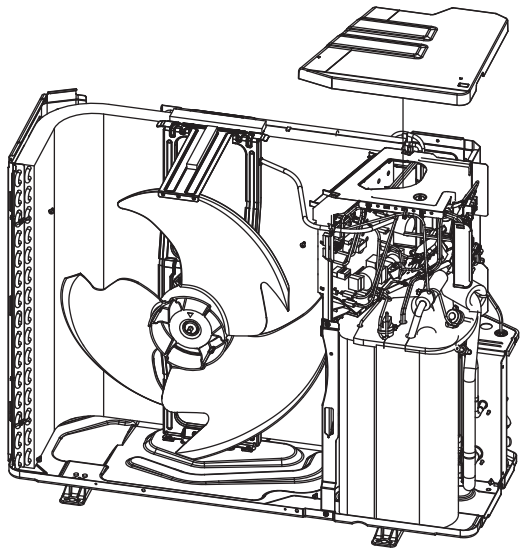
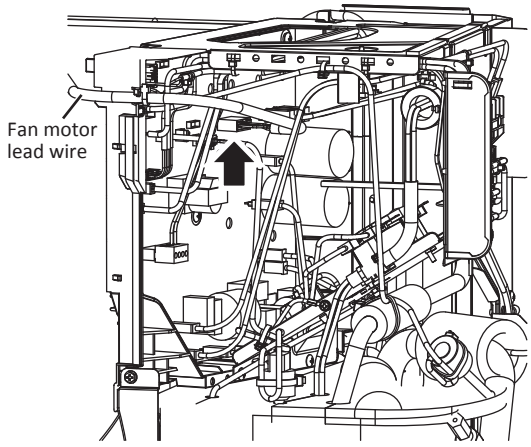
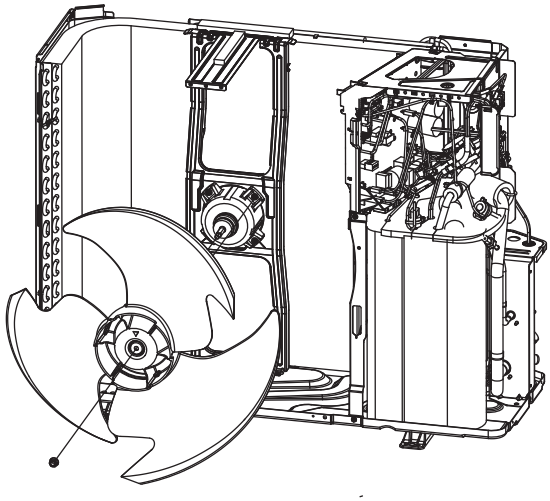
DX17VSS181/241/301/361AA

Step	Procedure		Points
1	Remove 8 screws and remove the right side panel.		■ When reassembling, perform the procedures in inverse order. ■ All screws that are not mentioned are hexagon flanged screws (M4 × 12).
2	Remove 4 screws and remove the top panel.		
3	Remove 5 screws and remove the front panel.		■ The screw inside the discharge grille is a truss head tapping screw.

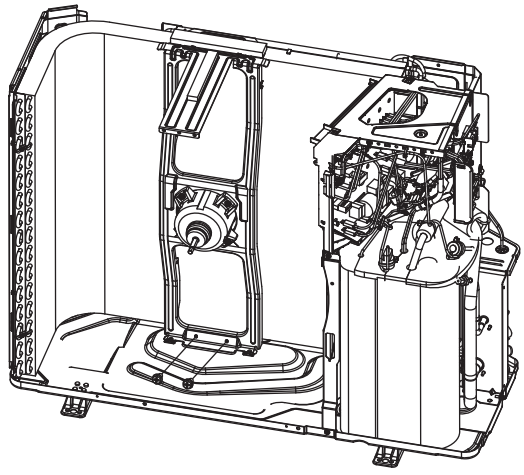
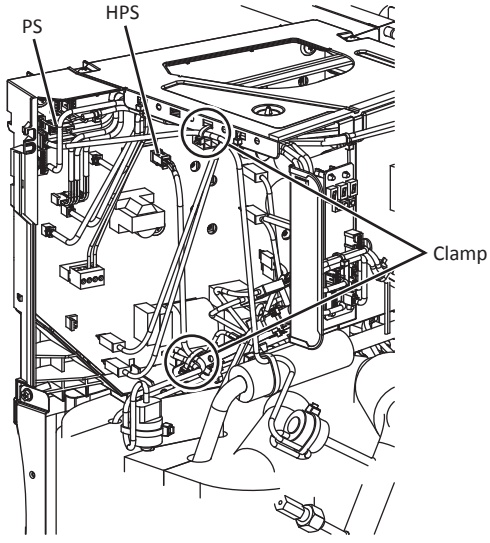
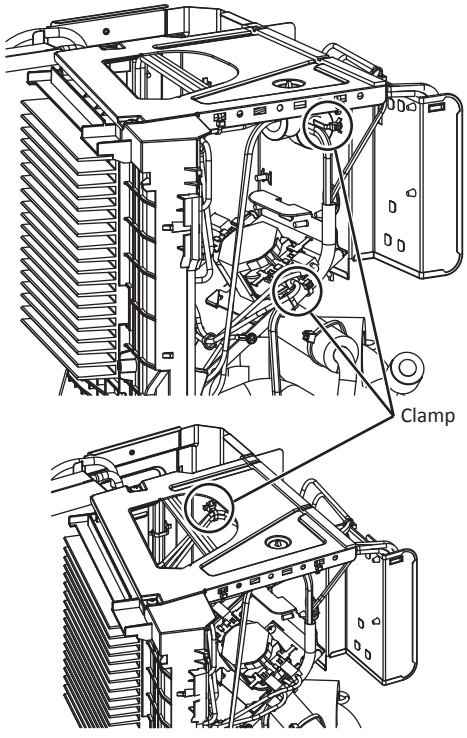
REMOVAL & REASSEMBLY PROCEDURE

Step	Procedure		Points
4	Remove 4 screws and remove the discharge grille.	  	■ The discharge grille screws are truss head tapping screws.

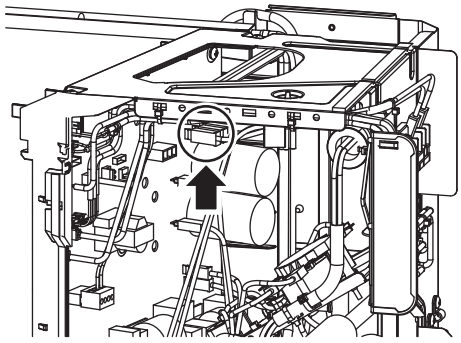
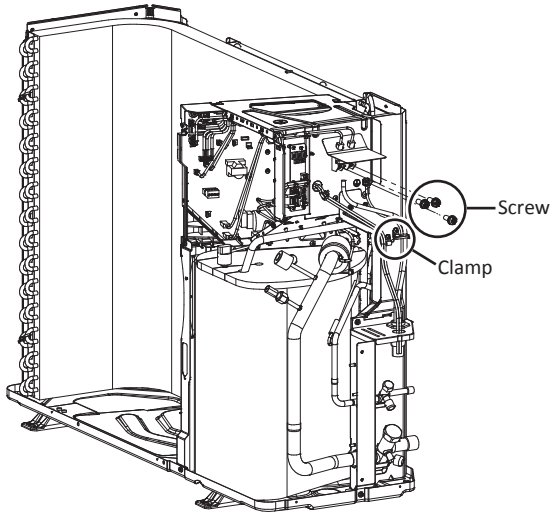
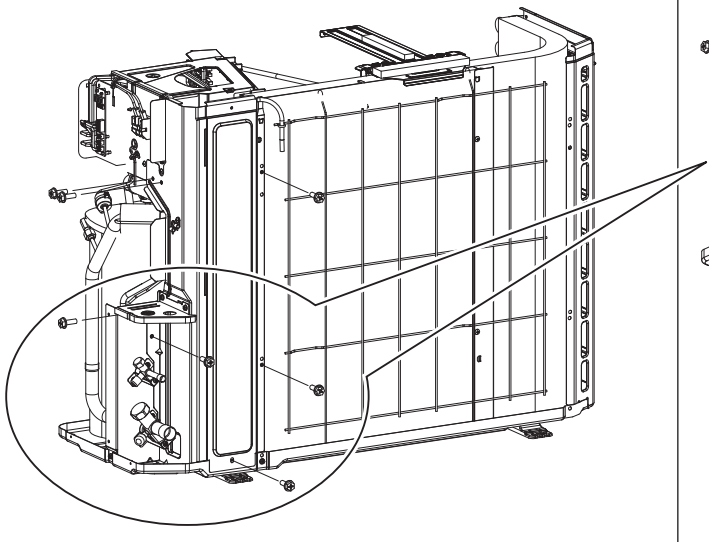
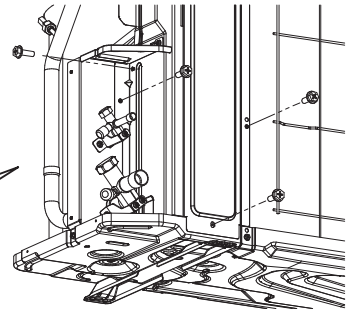
REMOVAL & REASSEMBLY PROCEDURE

Step	Procedure		Points
5	Remove the drip proof cover.		
6	Disconnect the fan motor lead wire.		
7	Remove the nut and remove the fan.		■ Nut size: M8

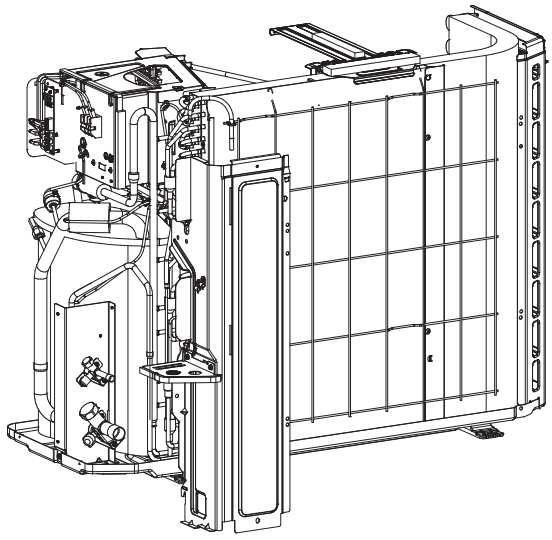
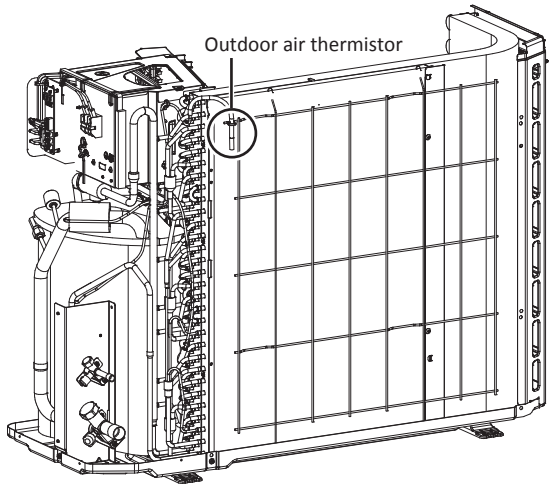
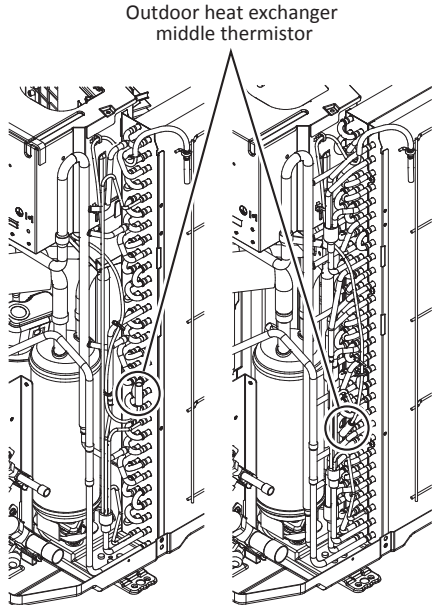
REMOVAL & REASSEMBLY PROCEDURE

Step	Procedure		Points
8	Remove 2 screws and remove the fan motor stand.		
9	Cut the 2 clamps and disconnect the HPS and PS lead wires. After maintenance, retie the wires to the same positions in order to prevent malfunction.		■ All clamps that are cut should be returned to the same position (by new clamps) to retie the wires after maintenance in order to prevent malfunction.
10	Cut the 4 clamps and disconnect the compressor lead wire.		

REMOVAL & REASSEMBLY PROCEDURE

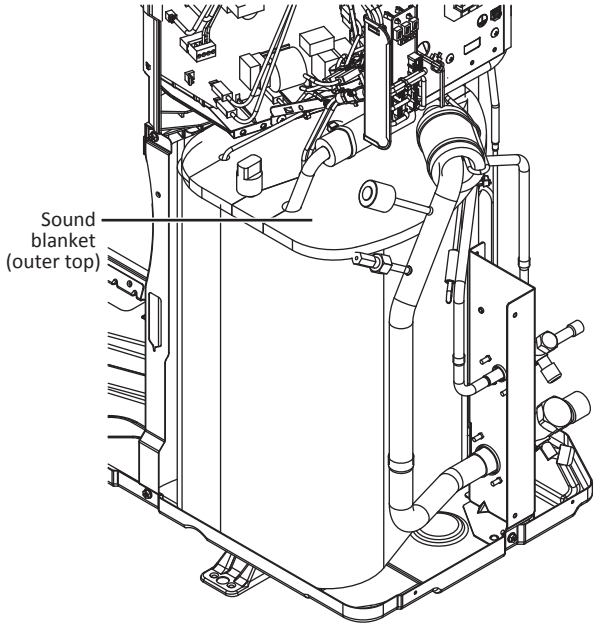
Step	Procedure		Points
			
11	Cut the 2 clamps, remove 3 screws and disconnect the external power supply and communication wires from the terminal block.		■ The 3 screws marked in a circle are pan head tapping screws. • 2 pc: M4 × 12 • 1 pc: M4 × 10
12	Remove 7 screws and remove the rear plate.		

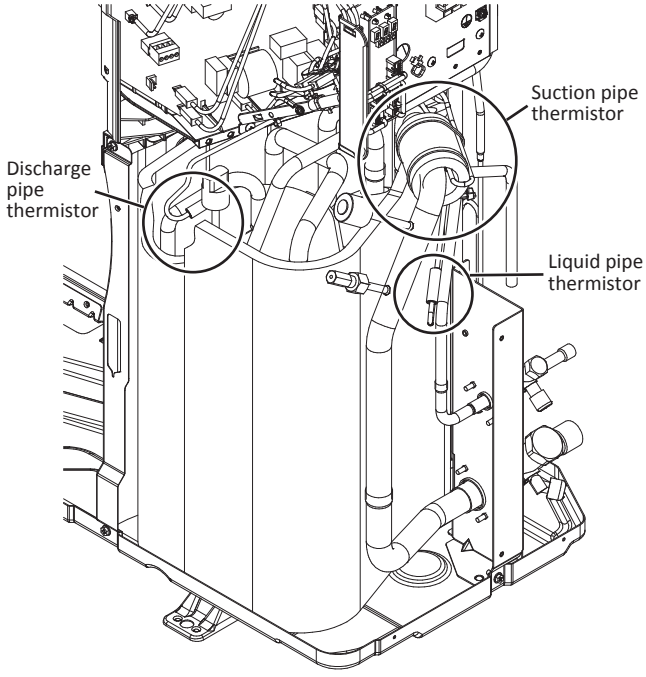
REMOVAL & REASSEMBLY PROCEDURE

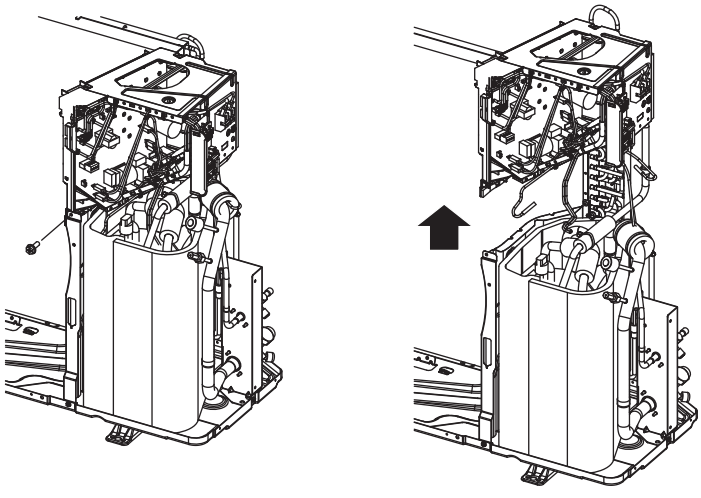
Step	Procedure		Points
13	Remove the outdoor air thermistor and outdoor heat exchanger middle thermistor.	  ■ For 1.5 - 2.5 ton models ■ For 3.0 ton model 	

REMOVAL & REASSEMBLY PROCEDURE

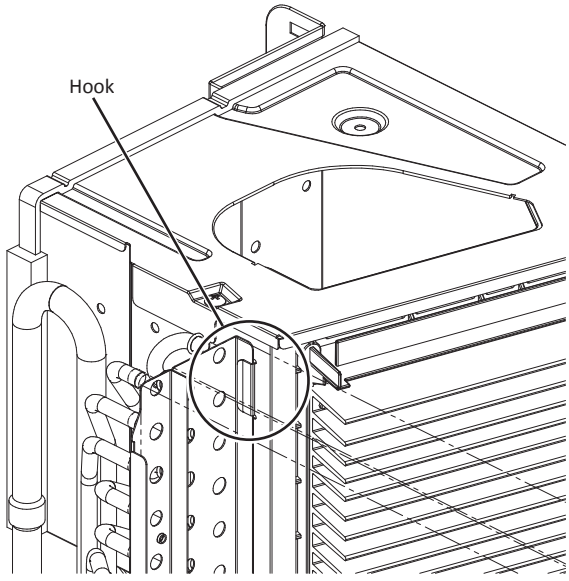
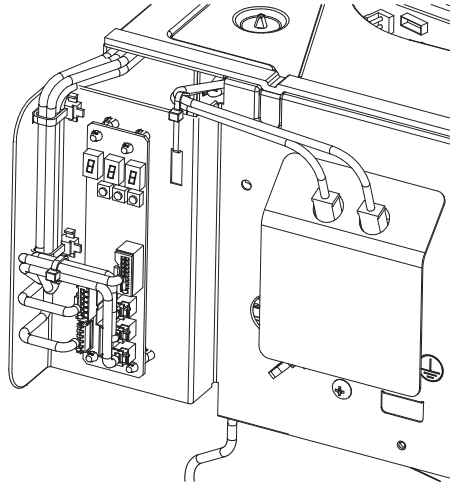
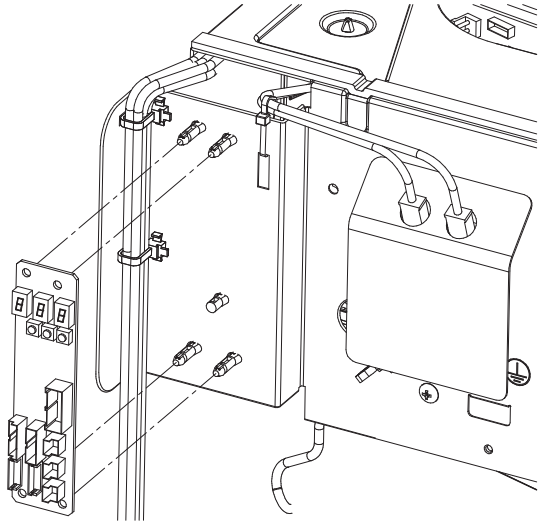
Step	Procedure	Points
14	Remove the sound blanket (outer top).	
15	Remove the suction pipe thermistor, discharge pipe thermistor and liquid pipe thermistor.	
16	Remove 1 screw and remove the electrical box.	



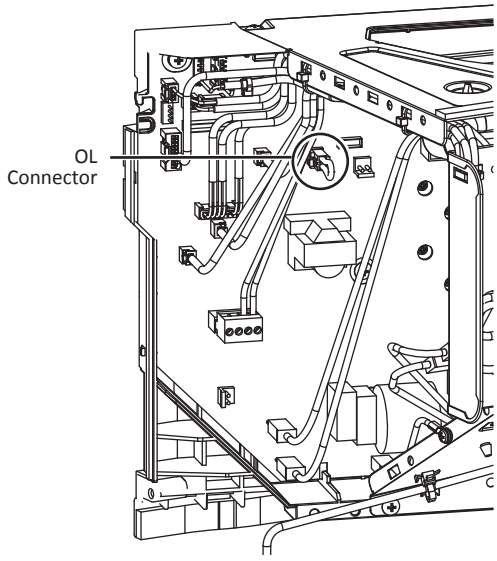
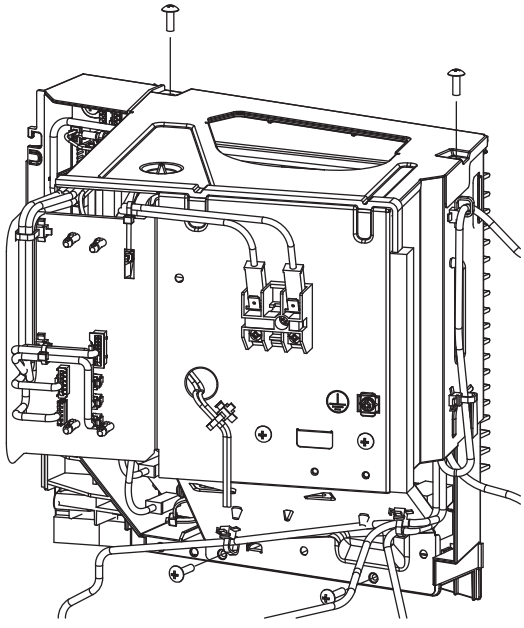
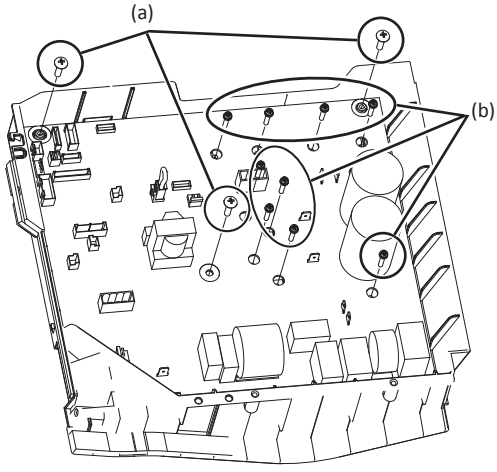




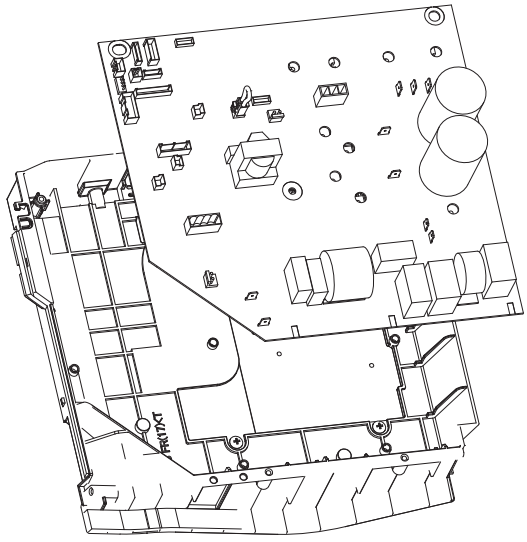
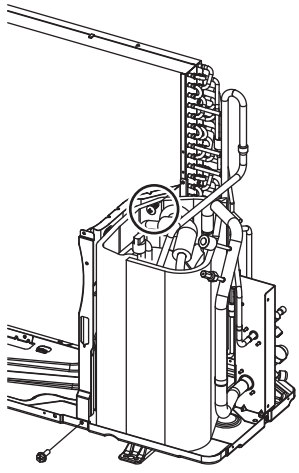
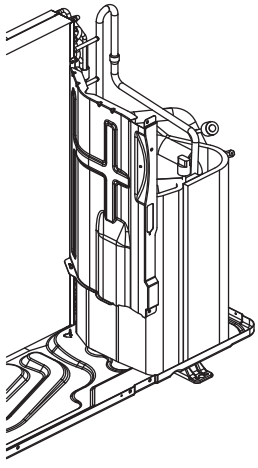
REMOVAL & REASSEMBLY PROCEDURE

Step	Procedure		Points
17	Disconnect the wires on the sub PCB, and then remove the sub PCB.	  	■ The electrical box is fixed to the tube plate by a hook.

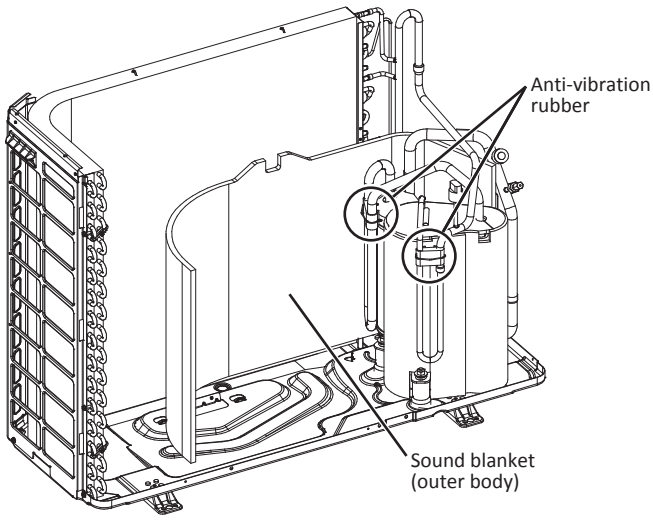
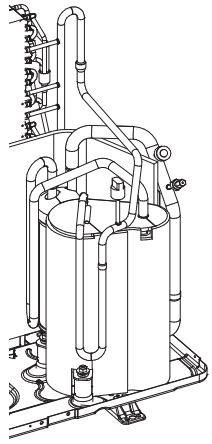
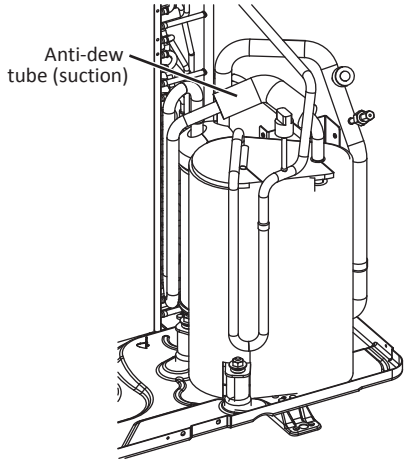
REMOVAL & REASSEMBLY PROCEDURE

Step	Procedure		Points
18	Disconnect all the connectors on the main PCB except the OL connector.		
19	Remove 4 screws and remove the mounting plate for terminal block.		■ The mounting plate screws are truss head tapping screws. • Upper screws: M4 × 12 • Lower screws: M4 × 16
20	Remove 12 screws and remove the main PCB.		■ The main PCB screws are: (a) Truss head tapping screws (3 pc: M4 × 16) (b) Pan head machine screws (9 pc: M3 × 16).

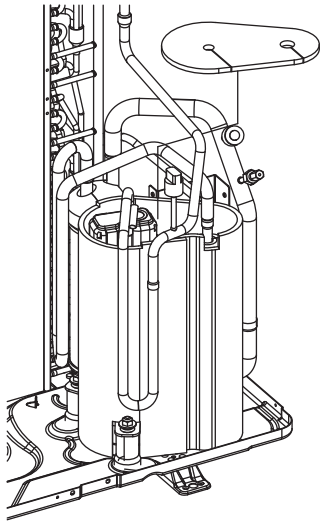
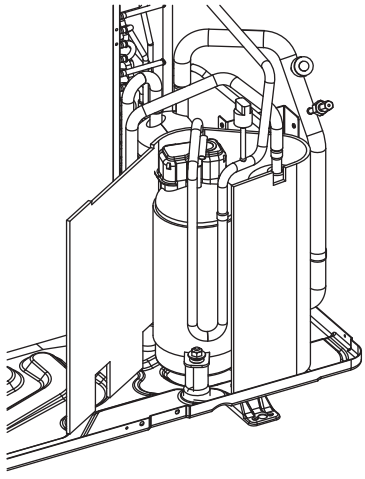
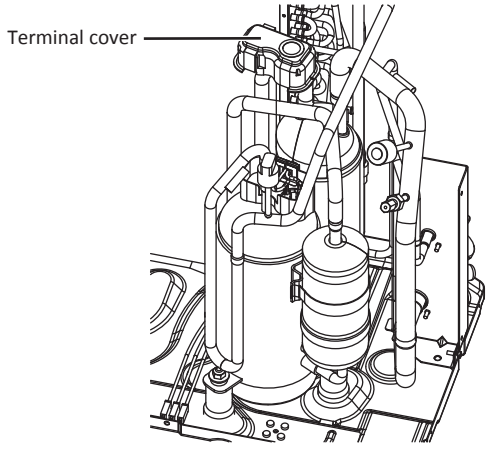
REMOVAL & REASSEMBLY PROCEDURE

Step	Procedure		Points
21	Remove 2 screws and remove the partition plate.	  	■ The upper screw is a truss head tapping screw (M4 × 12).

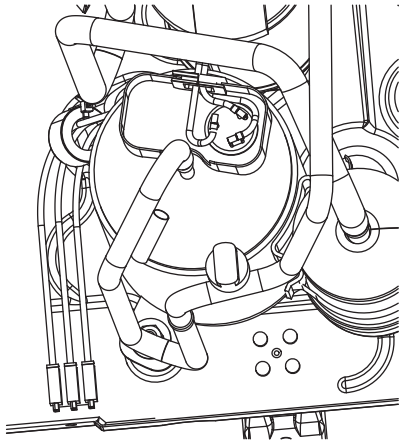
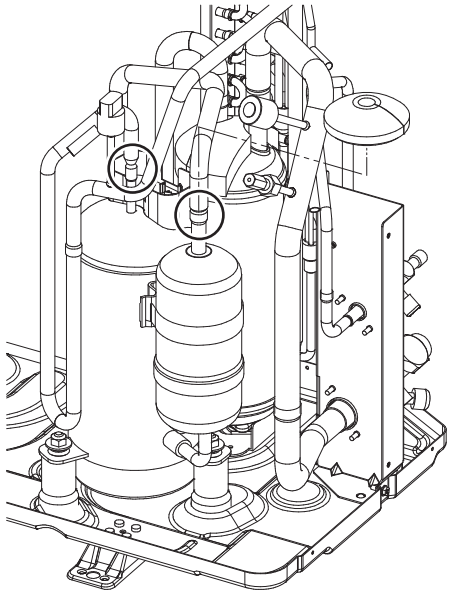
REMOVAL & REASSEMBLY PROCEDURE

Step	Procedure		Points
22	Remove the sound blanket (outer body).		■ For 1.5 - 2.0 ton models, return the anti-vibration rubbers to the same position after maintenance if they are removed during maintenance. ■ For 2.5 - 3.0 ton models, there is no anti-vibration rubber. 
23	Remove the anti-dew tube (suction).		■ The illustration is for 3 ton model as representative.

REMOVAL & REASSEMBLY PROCEDURE

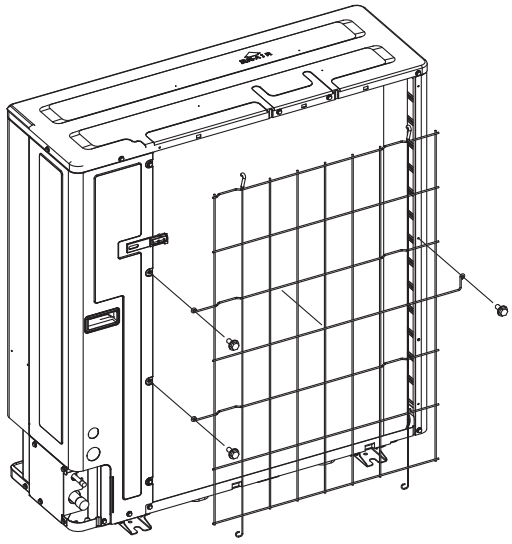
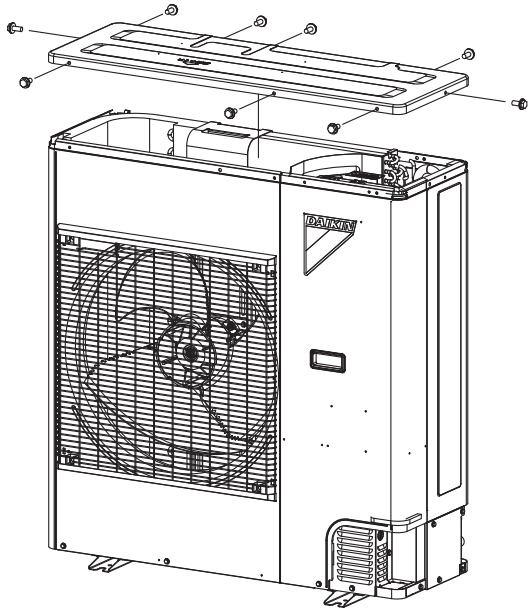
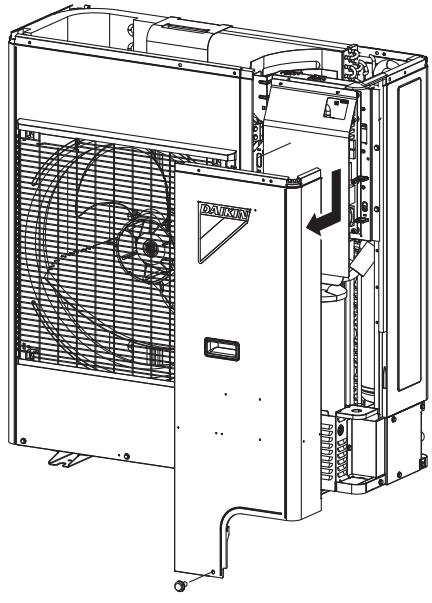
Step	Procedure		Points
24	Remove the sound blanket (inner top).		■ The illustration is for 3 ton model as representative.
25	Remove the sound blanket (inner body).		■ The illustration is for 3 ton model as representative.
26	Remove the terminal cover.		■ The illustration is for 3 ton model as representative.

REMOVAL & REASSEMBLY PROCEDURE

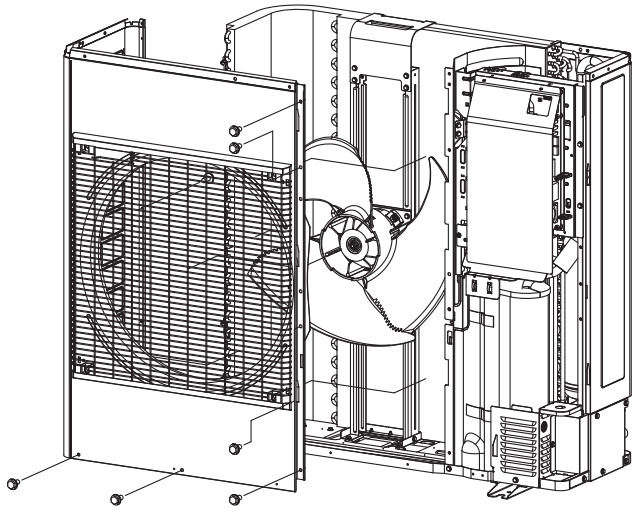
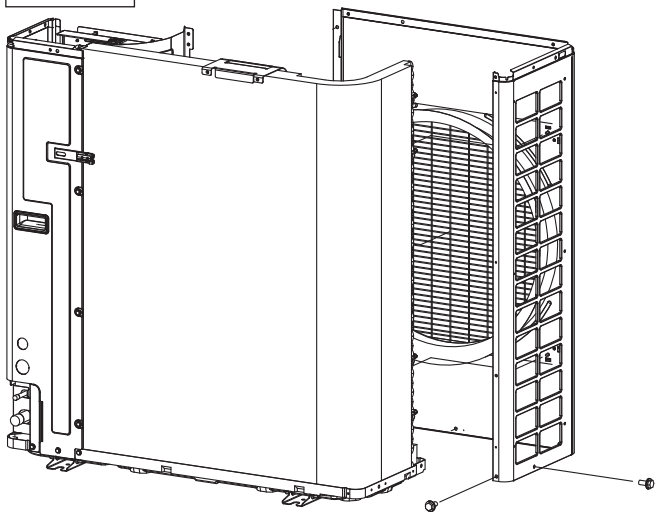
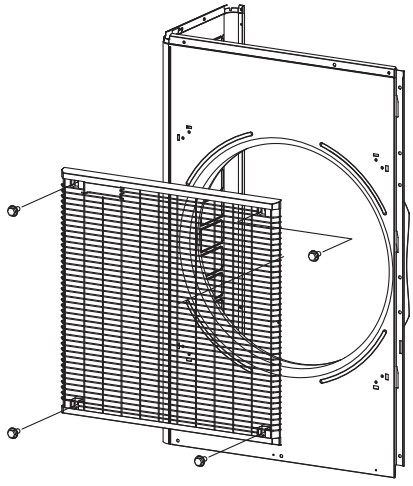
Step	Procedure		Points
27	Disconnect the compressor lead wire.		■ The illustration is for 3 ton model as representative.
28	Heat up the brazed part of compressor piping and disconnect it.		■ The illustration is for 3 ton model as representative. ■ Before working, be sure to remove any putties, the terminal cover, and other plastic pieces that may burn. Also, provide a protective sheet or a steel plate so that the brazing flame cannot influence peripheries.

REMOVAL & REASSEMBLY PROCEDURE

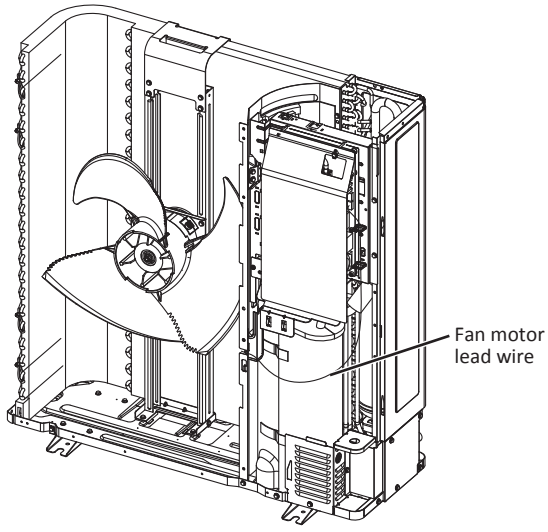
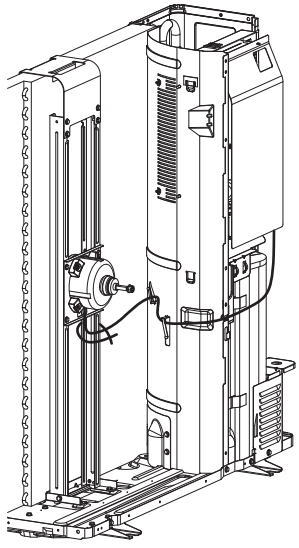
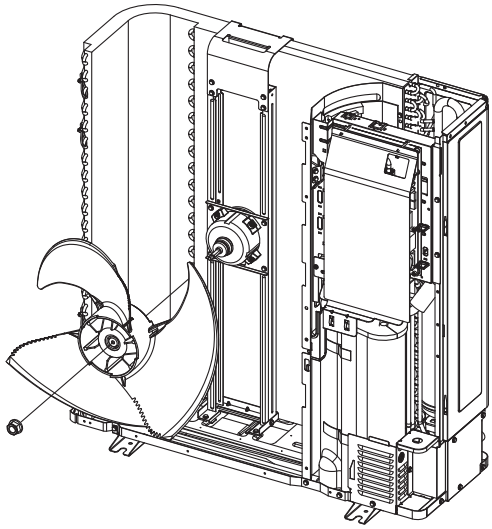
DX17VSS421/481/601AA

Step	Procedure		Points
1	Remove 3 screws and remove the suction grille.		■ When reassembling, perform the procedures in inverse order. ■ All screws that are not mentioned are hexagon flanged screws (M5 × 12).
2	Remove 9 screws and remove the top panel.		
3	Remove 1 screw and push down to remove the front panel (2).		

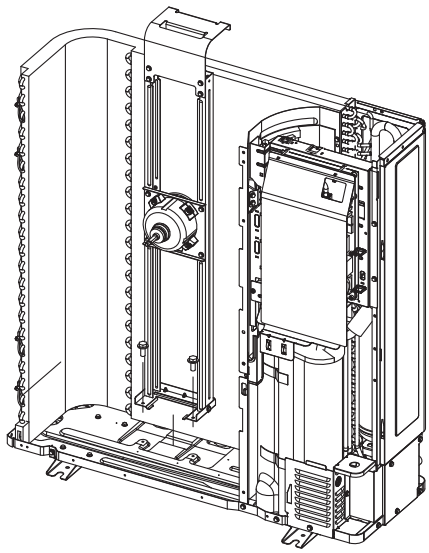
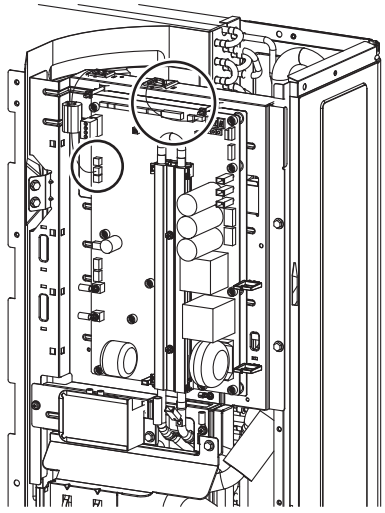
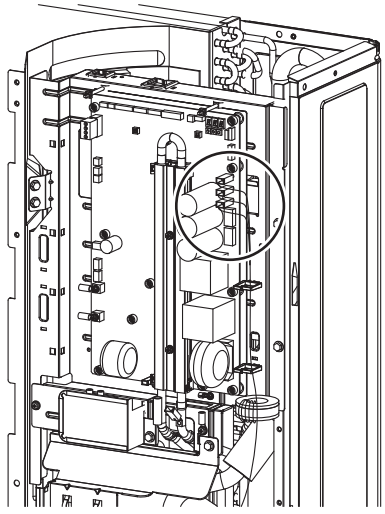
REMOVAL & REASSEMBLY PROCEDURE

Step	Procedure	Points
4	Remove 8 screws and remove the front panel (1).  Back view 	
5	Remove 4 screws and remove the discharge grille. 	■ The discharge grille screws are truss head tapping screws.

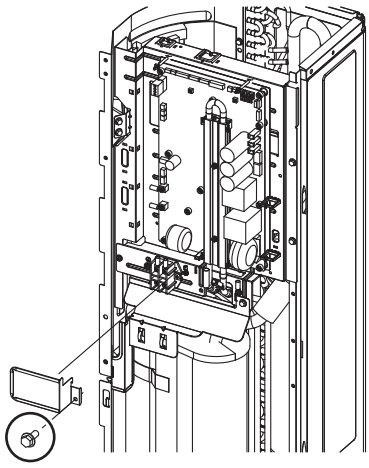
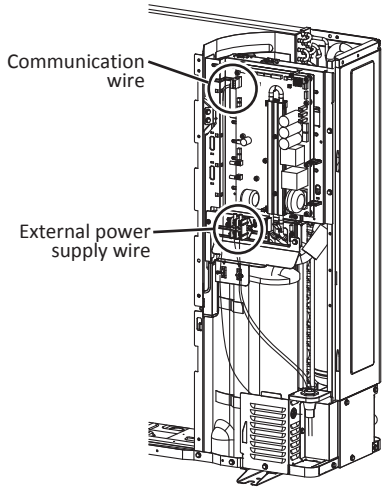
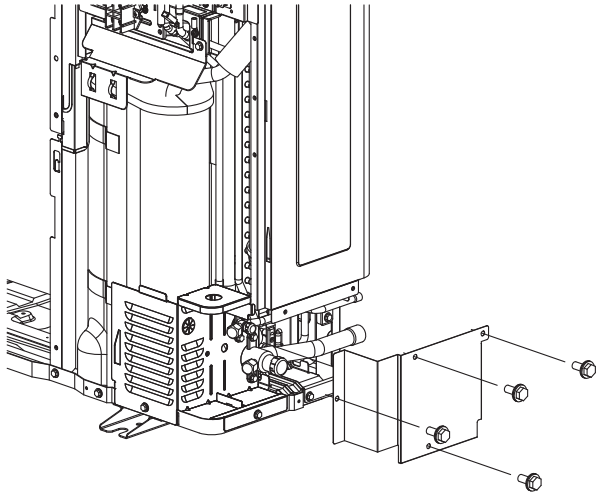
REMOVAL & REASSEMBLY PROCEDURE

Step	Procedure		Points
6	Disconnect the fan motor lead wire.		■ When reassembling, follow the illustration on the left to avoid entanglement with the outdoor fan.
			
7	Remove the nut and remove the fan.		■ Nut size: M8

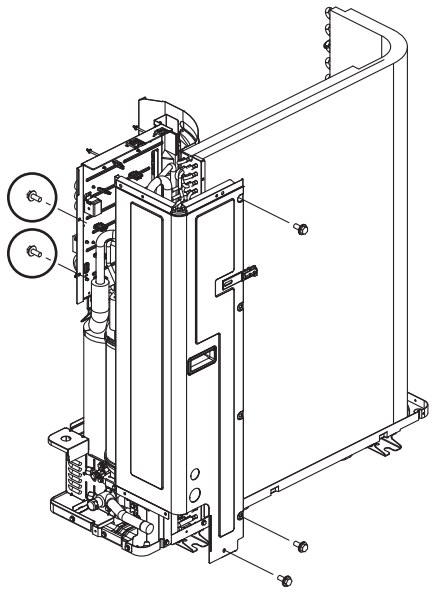
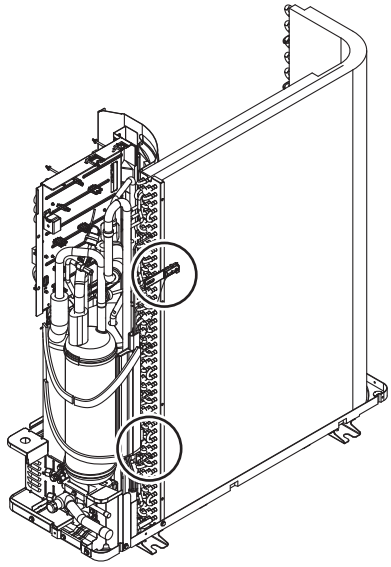
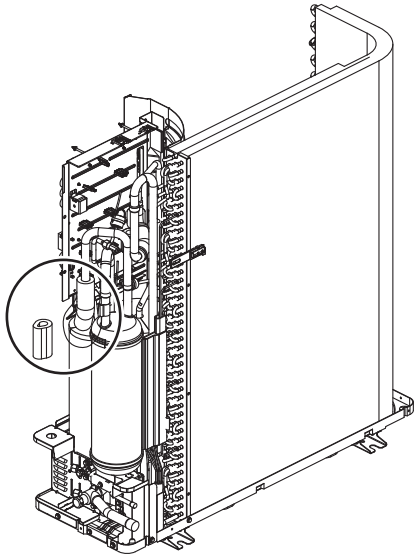
REMOVAL & REASSEMBLY PROCEDURE

Step	Procedure		Points
8	Remove 2 screws and remove the fan motor stand.		
9	Disconnect the HPS and PS lead wires.		
10	Disconnect and remove the compressor lead wire.		

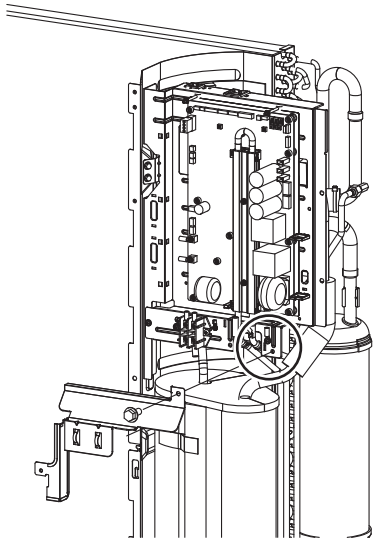
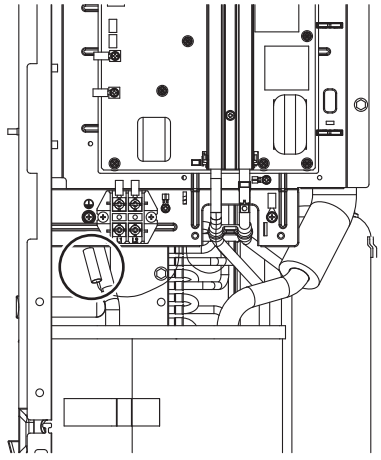
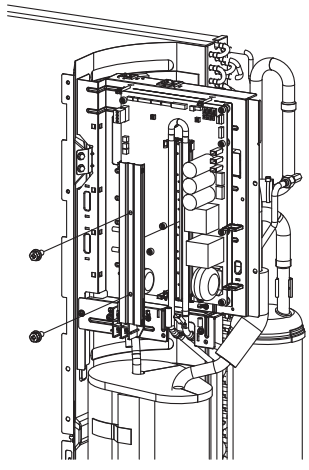
REMOVAL & REASSEMBLY PROCEDURE

Step	Procedure		Points
11	Remove 1 screw and remove the shield plate.		■ The screw marked with a circle is a 3 class truss head tapping screw.
12	Disconnect the external power supply and communication wires.		
13	Remove 4 screws and remove the side cover.		

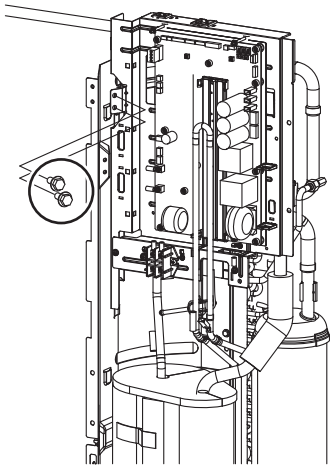
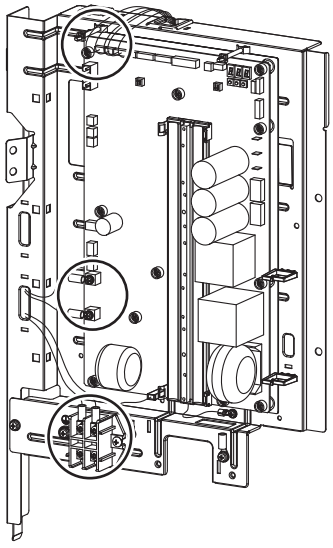
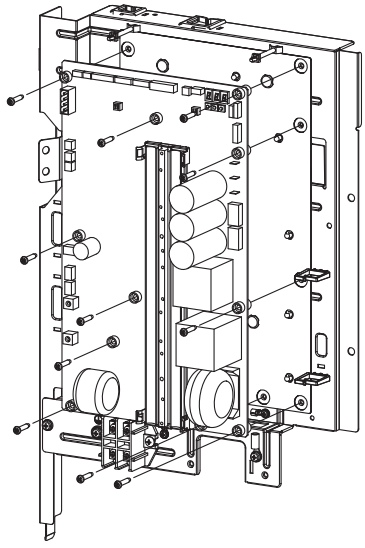
REMOVAL & REASSEMBLY PROCEDURE

Step	Procedure		Points
14	Remove 5 screws and remove the right side plate.		■ The screws marked with circles are 3 class truss head tapping screws. Use the same screws when reassembling.
15	Remove the outdoor air thermistor and outdoor heat exchanger middle thermistor.		
16	Remove the insulation tube and the suction pipe thermistor.		

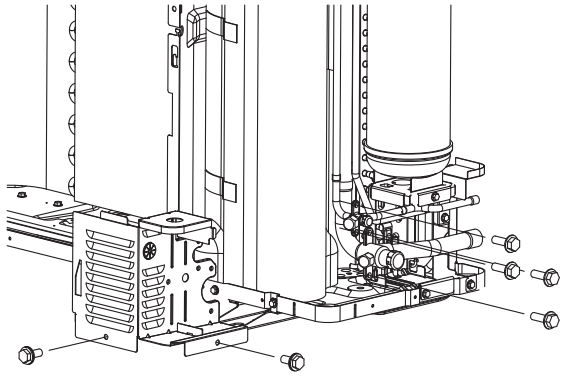
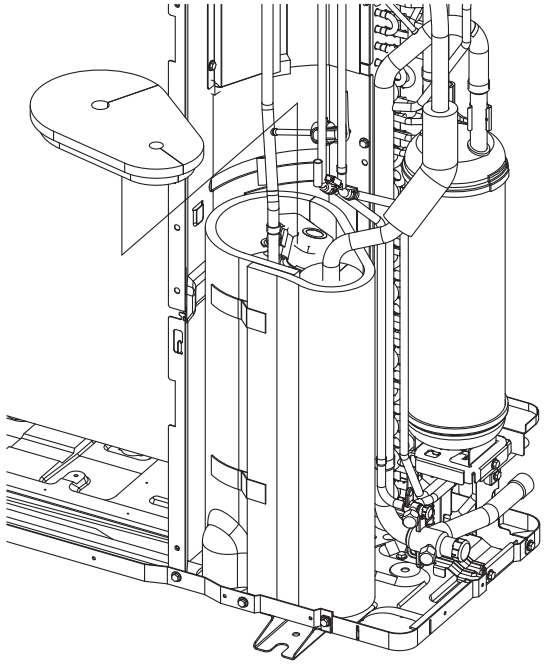
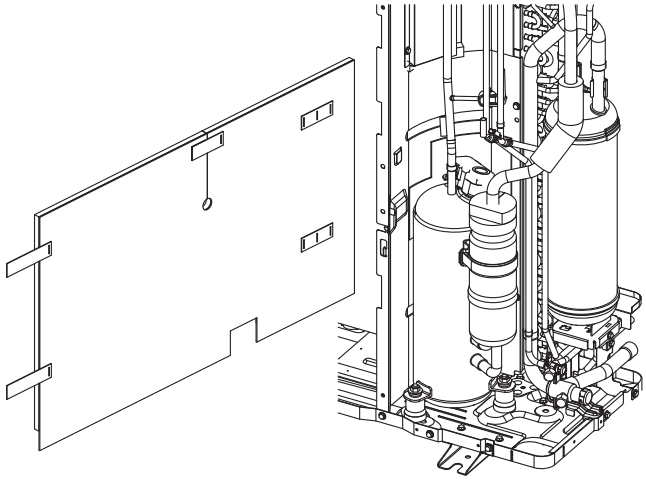
REMOVAL & REASSEMBLY PROCEDURE

Step	Procedure		Points
17	Remove 1 screw and remove the field wiring plate.		
18	Remove the discharge pipe thermistor and liquid pipe thermistor.		
19	Remove 2 screws and remove the refrigerant cooling pipe.		■ The refrigerant cooling pipe screws are different from the remaining screws. Do not mix the screws.

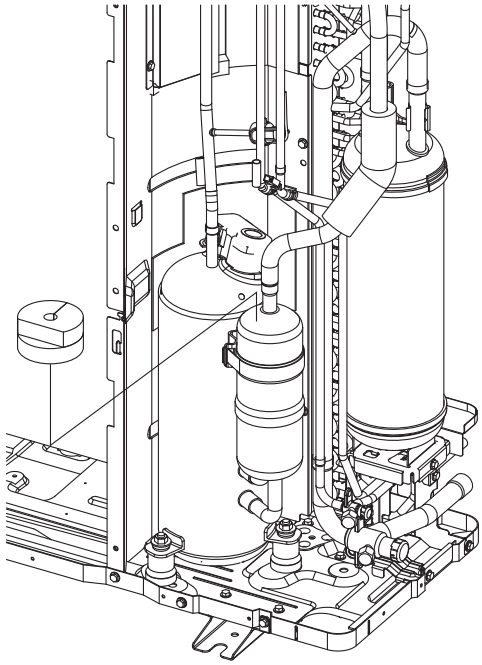
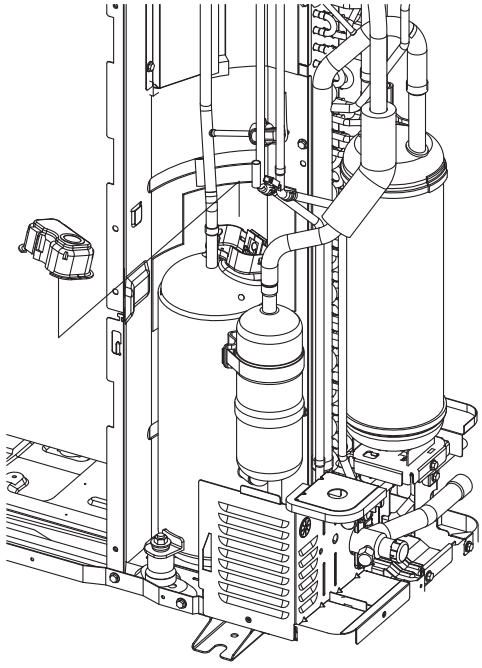
REMOVAL & REASSEMBLY PROCEDURE

Step	Procedure		Points
20	Remove 2 screws and remove the electrical box.		■ The screws marked with a circle are 3 class truss head tapping screws.
21	Disconnect the connectors, the power supply cable and the earth wires for PCB and refrigerant cooling pipe.		
22	Remove 11 screws and remove the main PCB.		

REMOVAL & REASSEMBLY PROCEDURE

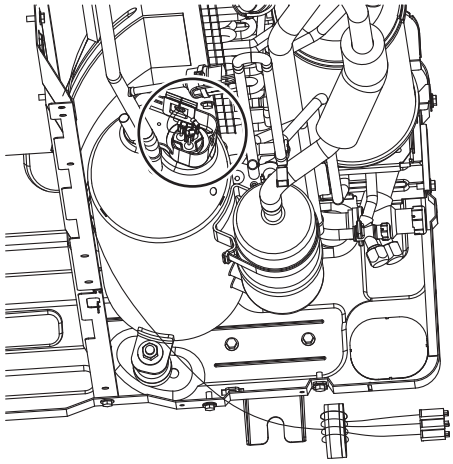
Step	Procedure		Points
23	Remove 6 screws and remove the stop valve installation plate.		
24	Remove the sound blanket (top).		
25	Remove the sound blanket (body).		

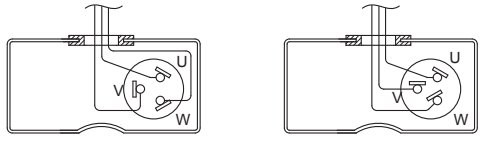
REMOVAL & REASSEMBLY PROCEDURE

Step	Procedure		Points
26	Remove the anti-vibration putty.		
27	Remove the terminal cover.		

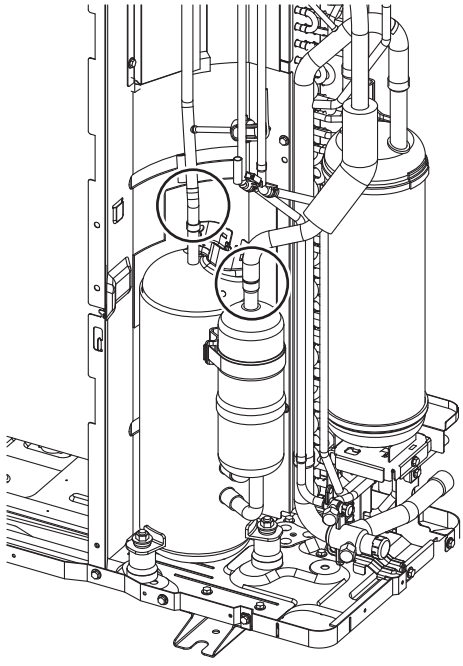
REMOVAL & REASSEMBLY PROCEDURE

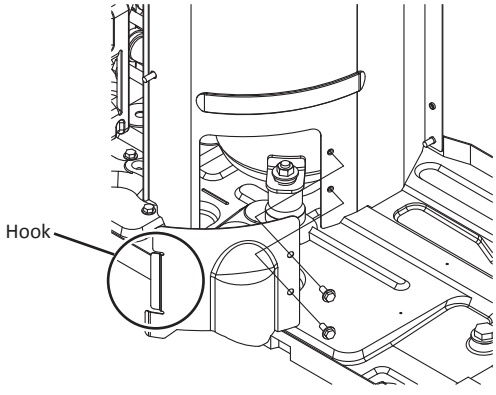
Step	Procedure	Points
28	Disconnect the compressor lead wire.	■ The wiring is different depending on the model. Be sure to connect the lead wires as shown in the left.
29	Heat up the brazed part of compressor piping and disconnect it.	■ Before working, be sure to remove any putties, the terminal cover, and other plastic pieces that may burn. Also, provide a protective sheet or a steel plate so that the brazing flame cannot influence peripheries.
30	Remove 2 screws and remove the partition plate cover. Then, remove the 3 nuts that secure the compressor.	■ When reassembling the partition plate cover, make sure the hook is inserted in the right position.





DX17VSS421/481AA DX17VSS601AA





REVISION HISTORY

Month / Year	Version	Revised contents
09 / 2018	SiUS611804E	First edition

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